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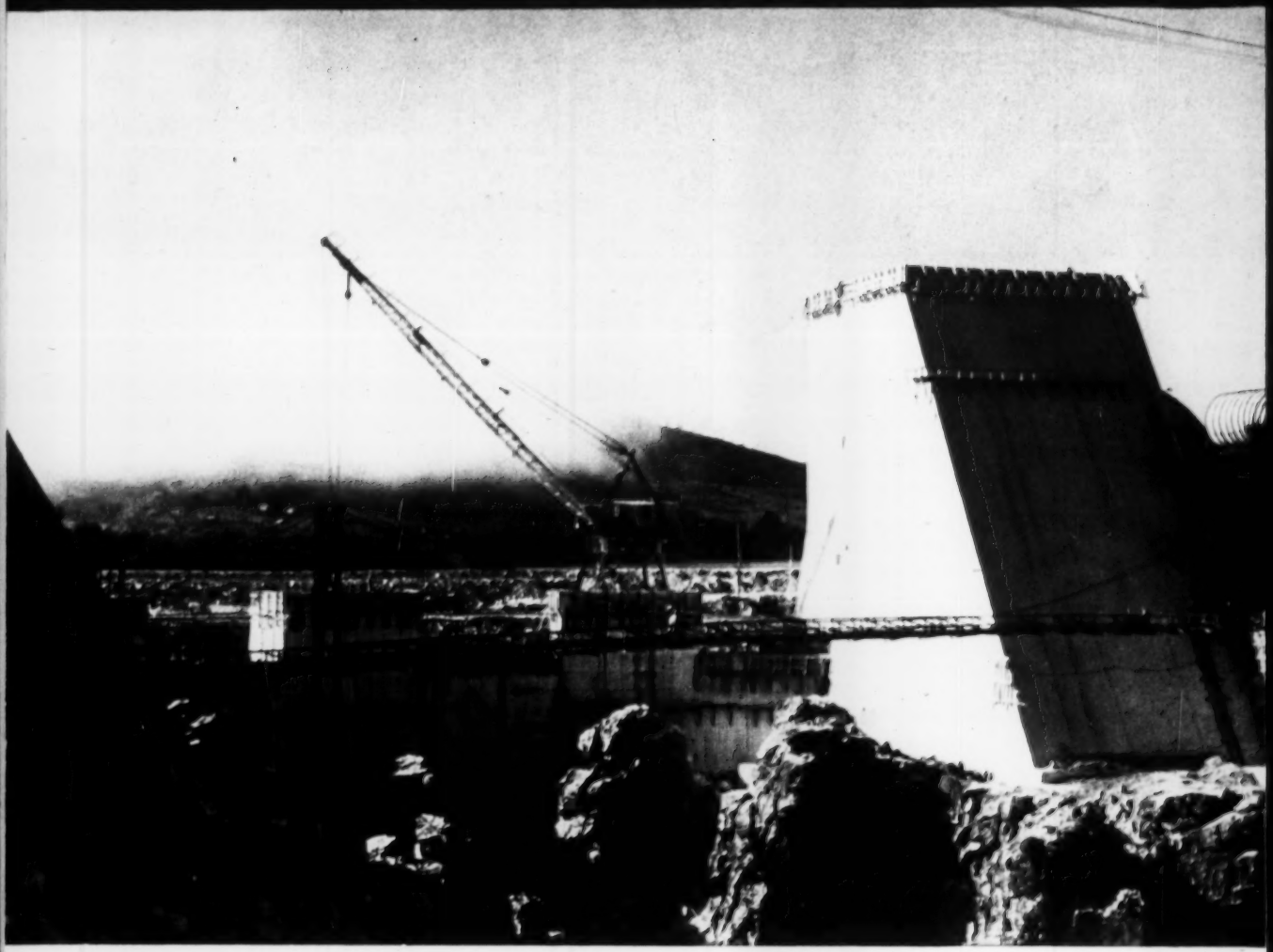

Peixoto: An arch between gravity sections p. 43

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While improving highway design, construction ...get MAXIMUM safety!

Armco FLEX-BEAM Guardrail protects danger spots on the West Virginia Turnpike.

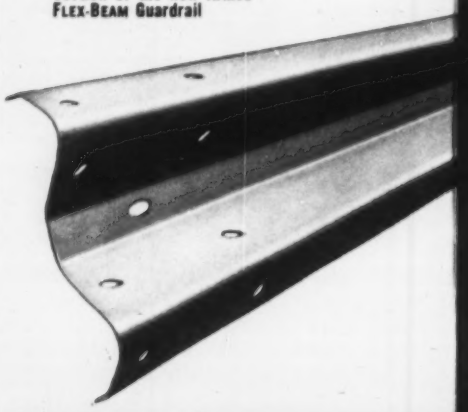
Engineers are making today's highways straighter, smoother, wider for safer and easier driving. And just to make sure, many engineers are installing Armco FLEX-BEAM Guardrail to provide **maximum** safety at highway danger spots.

This sturdy, beam-type steel guardrail with controlled flexibility helps minimize property damage—often saves lives. Beam strength extends through the joints to help control vehicles and prevent dangerous pocketing. And FLEX-BEAM has just the right amount of flexibility to cushion the shock of impact. At night, FLEX-BEAM is a visual barrier that increases driver confidence.

What about acceptance? Armco FLEX-BEAM Guardrail has been installed on roads and highways all over the country for the past 17 years. Today, it is used on nine major expressways in as many states.

Installation is a cinch. Sections of FLEX-BEAM are joined by nine bolts, one of which fastens the sections to posts of any material. Work goes fast, even on curves. Write for more details. Armco Drainage & Metal Products, Inc., 3586 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Section of the new Armco FLEX-BEAM Guardrail



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FLEX-BEAM
GUARDRAIL

All-round Dirt-Moving Team

for low-cost operation

LARGE ENOUGH to get jobs done fast—
SMALL ENOUGH for profitable use on low-yardage jobs

HD-11 crawler—75 drawbar hp. Gets more work done faster and at lower cost with these on-the-job advantages: shock-absorbing, all-steel, box-A main frame; rugged final drives that ride on straddle-mounted roller bearings; 1,000-hour lubrication intervals for truck wheels, idlers and support rollers; ceramic-lined master clutch that requires fewer adjustments, provides extra long life; plus new operator convenience that includes a big foam rubber seat and 24-volt direct electric starting.

AC-106 scraper—6.1 yd struck, 7.5 yd heaped. Plenty of features for fast, low-cost dirt moving: curved, offset cutting edge and "center-boiling" loading action; wide, low bowl to keep center of gravity low; high-flotation tires and ample ground clearance; maximum stability for working on slopes or rough terrain; 81-in. apron opening and forward-forced ejection for quick, clean dumping; easy adjustments; simple sheave system.

• • •

See these and other important earth-moving advantages of Allis-Chalmers crawler tractor and scraper combinations at your Allis-Chalmers construction machinery dealer. He has complete facilities to serve you—factory-trained servicemen, factory-approved methods and complete stocks of True Original Parts.

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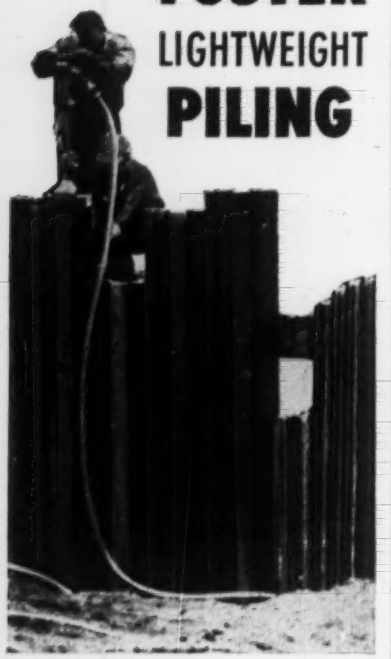

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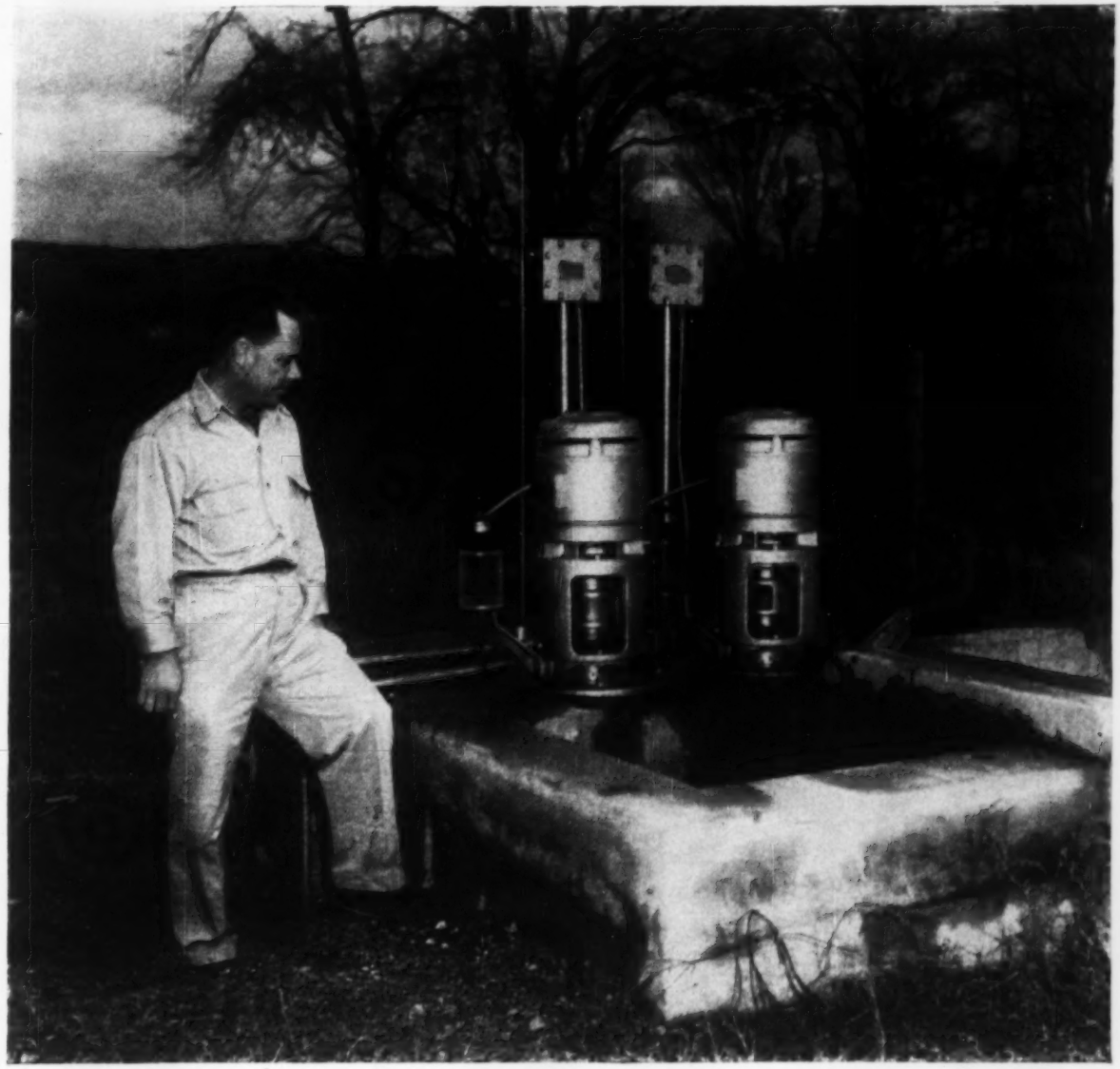

"I can forget them"

Public Works Superintendent Floyd Bailey says his Fairbanks-Morse bladeless sewage pumps haven't clogged once since they were started up three and a half years ago. This has given him more time to spend on his other duties like road maintenance and the water supply system.

The place is Blountsville, Alabama—population 695. You'll find Fairbanks-Morse sewage pumps doing equally reliable jobs in New York and Washington . . . in Los Angeles and San Francisco.

Fairbanks-Morse builds pumps for all magnitudes of water supply and sewage disposal . . . and the motors and engines to drive them. If you are outgrowing your municipal utilities, please give us the opportunity to work with your consulting engineers. Fairbanks, Morse & Co., Dept. ENR-82, Chicago 5, Illinois.

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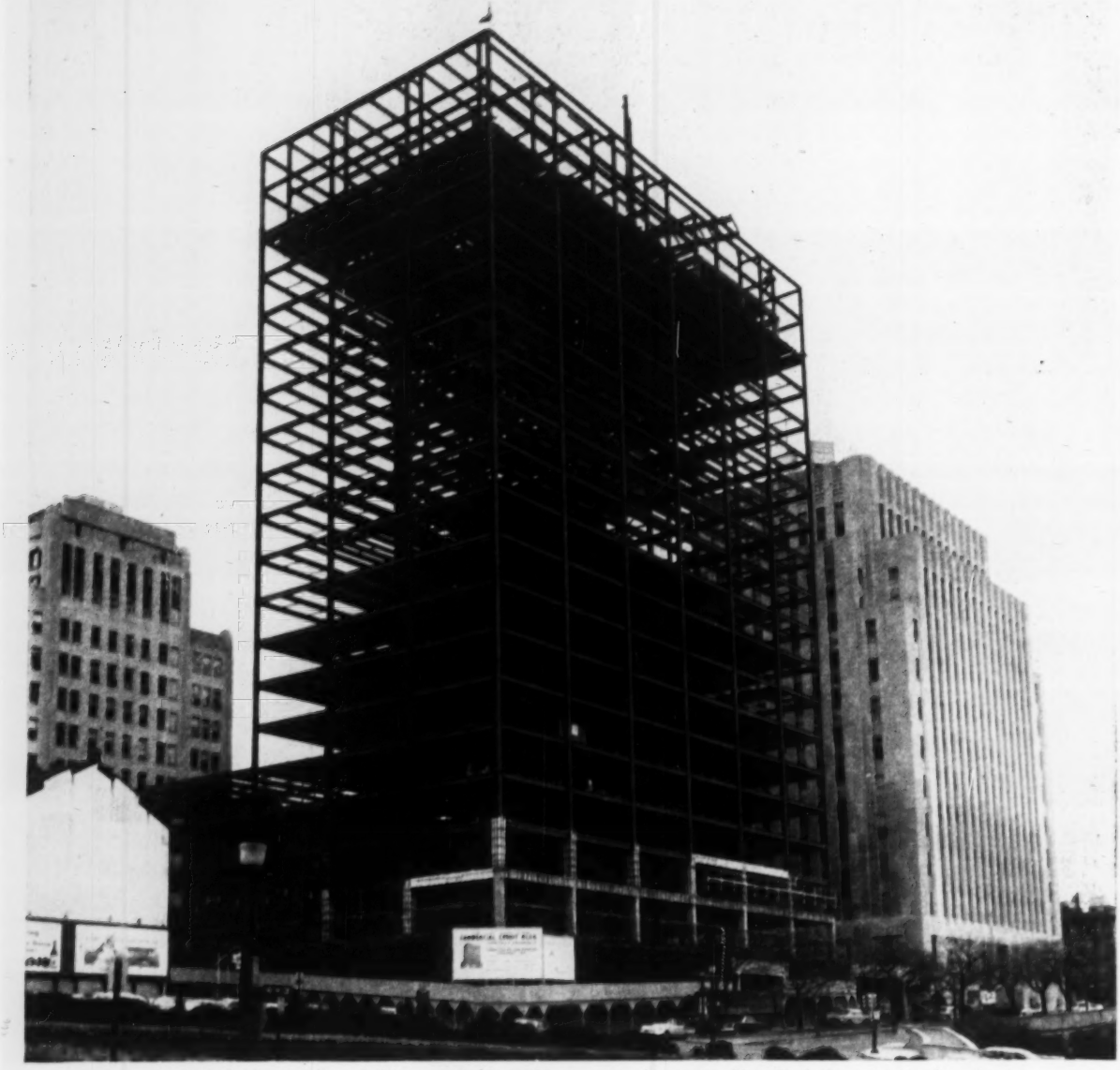


Commercial Credit Building, Baltimore. *Architect:* Harrison & Abramovitz, New York City; *structural engineer:* Edwards & Hjorth, New York City; *general contractor:* Consolidated Engineering Company, Inc., Baltimore.

BIG NEW BUILDING IN BALTIMORE

This is the steel skeleton for Baltimore's handsome new 20-story skyscraper, shown shortly after topping out by a Bethlehem erection crew. Commercial Credit Company, the owner, and its associated companies will occupy the second through the ninth floors, leasing the eleven upper floors, each providing about 12,000 sq ft of usable space. Areas on the ground and mezzanine floors will also provide rental income. A parking garage is located below street level.

Bethlehem ironworkers used high-strength structural bolts — 75,000 of them — in erecting the 4,850-ton steel framework. This was the first use of these modern, efficient fasteners for construction of a multi-story building in Baltimore.

In addition to air-conditioning and sound proofing throughout, design of the Commercial Credit Building includes such features as electronic, operator-less elevators, movable office partitions, non-slip floors and center-pivoted windows. Exterior treatment calls for gunmetal-colored aluminum panels above a first floor facade of Indiana limestone.

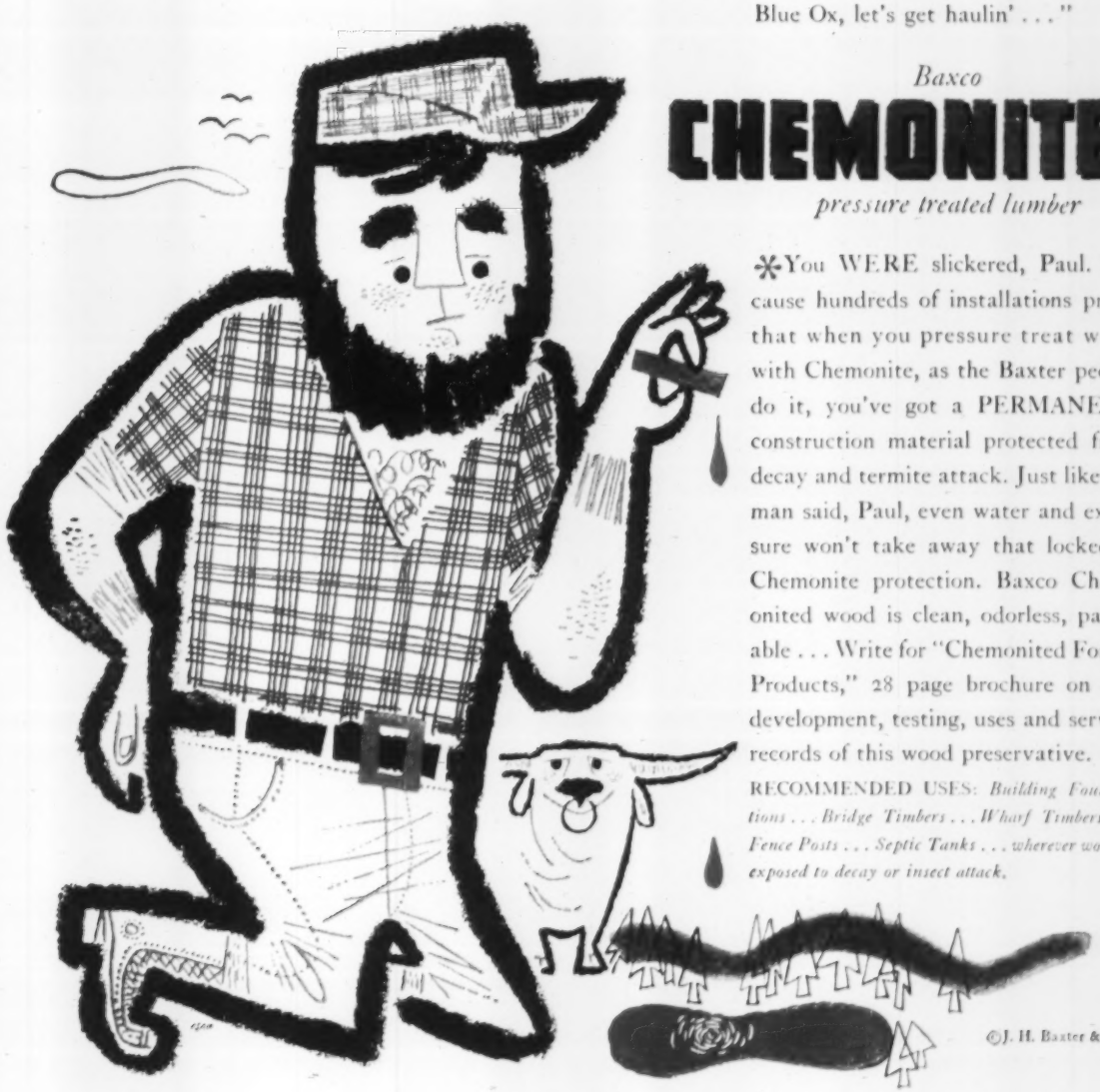
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

"Been settin' here, wettin' this fool stick for twenty years—and she ain't rotted yet." Paul Bunyan threw down the 12x12 Chemonited✻ timber in defeat. His disgusted sigh flattened 30 acres of prime Douglas fir. "Yessir, Babe, I been suckered again by a city slicker. That Baxter man bet me a year's free loggin' to a month in Frisco that that there stick would never rot—even in moist ground. On account of this new fangled presarvative, Chemonite✻ . . . Well come on, you lazy Blue Ox, let's get haulin' . . . "



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✻You WERE slickered, Paul. Because hundreds of installations prove that when you pressure treat wood with Chemonite, as the Baxter people do it, you've got a PERMANENT construction material protected from decay and termite attack. Just like the man said, Paul, even water and exposure won't take away that locked-in Chemonite protection. Baxco Chemonited wood is clean, odorless, paintable . . . Write for "Chemonited Forest Products," 28 page brochure on the development, testing, uses and service records of this wood preservative.

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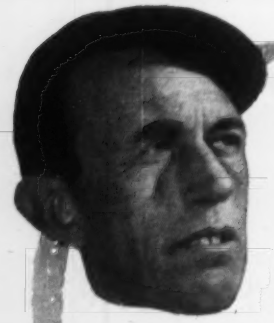
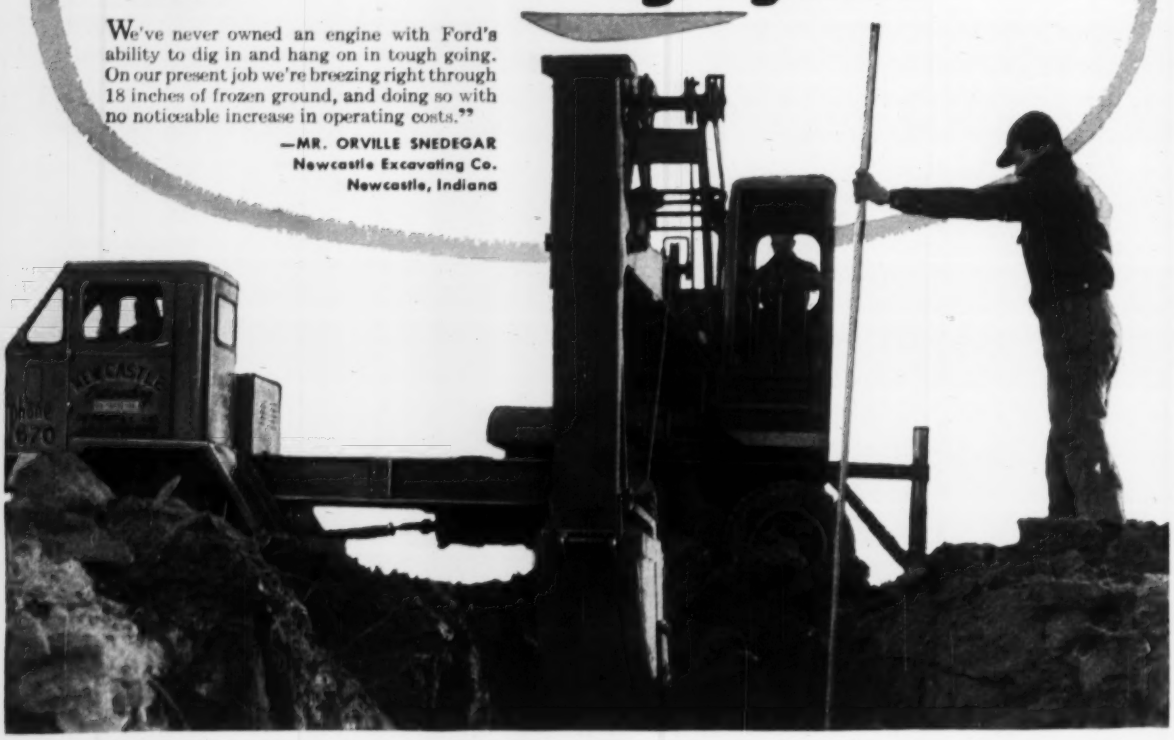


"Ford Power saves us money on the tough jobs"

We've never owned an engine with Ford's ability to dig in and hang on in tough going. On our present job we're breezing right through 18 inches of frozen ground, and doing so with no noticeable increase in operating costs."

—MR. ORVILLE SNEDEGAR
Newcastle Excavating Co.
Newcastle, Indiana



Mr. Snedegar operates a model 510 Unit Challenger, manufactured by the Unit Crane and Shovel Corp., Milwaukee, Wisconsin. Powered by a Ford "172" Heavy Duty Industrial Engine, the Challenger—as a clamshell, hoe or dragline—makes short work of *any* excavation job.

Ford Power is at work on all types of construction projects everywhere, *and with good reason.* For who else but Ford offers the industry a *full line* of modern overhead-valve 4-, 6- and 8-cylinder gasoline engines? And who else but Ford offers Short Stroke design and rigid deep-block construction in *every* engine?

Short Stroke design cuts friction, reduces engine wear and releases more *usable* power . . . power that goes to waste in ordinary engines. Deep-block construction combines with a host of other exclusive engineering advancements to make Ford Industrial Engines the heavy-duty endurance champs they are.

Little wonder, more and more every day, profit-minded operators are swinging to reliable, low-cost Ford Power. Why not you?

And remember . . . to better serve users of industrial power, a network of newly-appointed Ford Industrial Products Dealers has been set up across the nation. Now there is a Ford Industrial Power Headquarters in *your* area.

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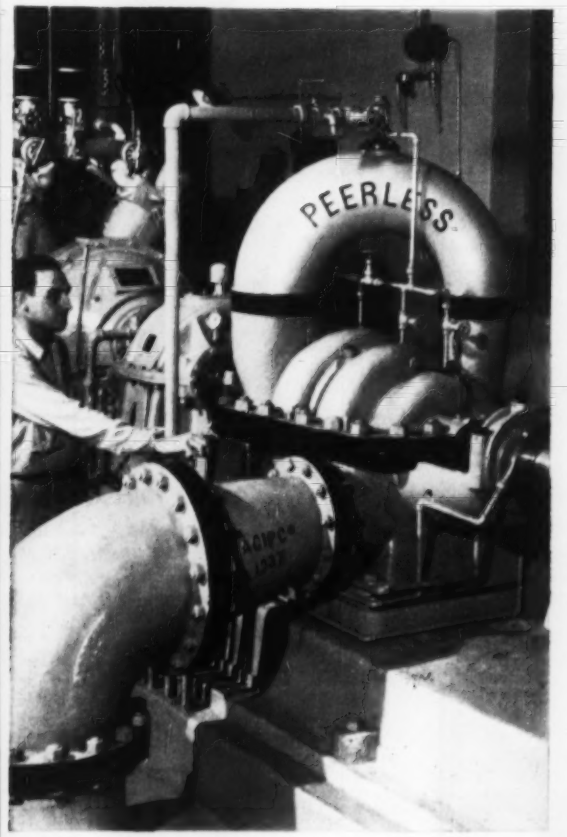
Dependability in action

THIS 20 YEAR OLD VETERAN HAS PUMPED 1,000,000 GALLONS A DAY EVERY DAY WITHOUT REPAIRS



No wonder the city officials and the 12,000 citizens of Boone, Iowa like this Peerless pump. For dependability and economy it has established a remarkable record rarely matched in municipal water pumping service: it has pumped a million gallons of water every day for 20 years *without repairs*. The only pump maintenance required has been the replacement of stuffing box packing and periodic lubrication.

At Peerless Pump we think this installation summarizes all the reasons for specifying and installing Peerless vertical and horizontal pumps. We assure you: if you want unexcelled performance, matchless economy, sound design, skilled construction and expert installation service Peerless is the line from which to specify *all* your needs for pumps.

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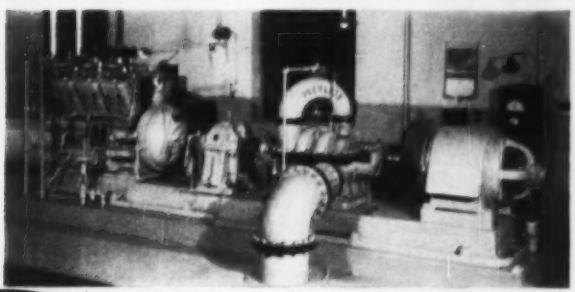
HERE'S THE RECORD

TYPE: Peerless Type TU; 2-stage horizontal pump,
OPERATOR: City of Boone, Iowa.
LOCATION: Des Moines River.
INSTALLED: 1937; in continuous operation for 20 years.
SERVICE: Supplies 90% of City of Boone, Iowa, water supply.
CAPACITY: 2000 gpm.
HEAD: 485' TDH.
DRIVES: Dual power drive; GE electric motor, Le Roi engine.
MAINTENANCE RECORD: No shutdowns for repairs. Replacement of packing and lubrication only maintenance performed.



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☐ Please send Type TU Pump Bulletin No. B-1400

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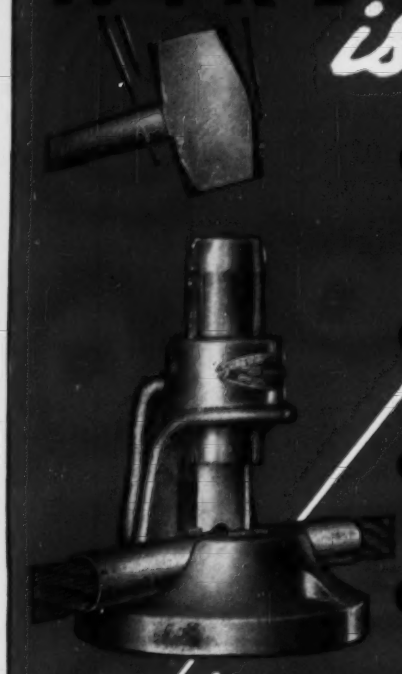
Cutting WIRE ROPE is easy



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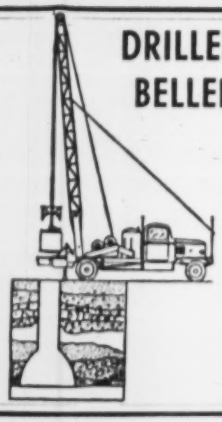

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Reader Comment

One Zero too Many

SIR—In the issue of Engineering News-Record for July 19th, we enjoyed reading the article, "Another State to License Contractors".

However, we would like to draw your attention to the fact that the laws of the Commonwealth of Virginia require licensing of contractors for all work over $20,000 not $200,000 as stated in the article.

DONALD ROBERTS
Sawyer Construction Co.
Hampton, Va.

Delay From Strikes

SIR—Permit me to congratulate you on the very excellent article regarding the highway bridge that is being constructed by the Mississippi River Bridge Authority over the river in New Orleans.

Our firm found the design of this structure to be a most interesting problem. Now, in the construction period, we are having trouble with strikes. First we suffered 55 days delay due to a jurisdictional strike, which started in New Orleans and then wound up with a strike of the rod setters working on the bridge.

This tied up all of the work just as we were about ready to seal the very deep, large river Pier II. This strike has now ended, and work has been resumed on both the river crossing and the approaches, but the delay could throw us into bad flood conditions.

Now we have the steel strike which will undoubtedly delay the fabrication of the superstructures. This could become quite serious since we are not requiring the erection to be carried on during hurricane seasons.

All this is disrupting our planned schedules, and could delay the ultimate completion of the bridge many months.

F. M. MASTERS
Modjeski and Masters,
Consulting Engineers
Harrisburg, Pa.

(Reader Comment continued on p. 10)

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

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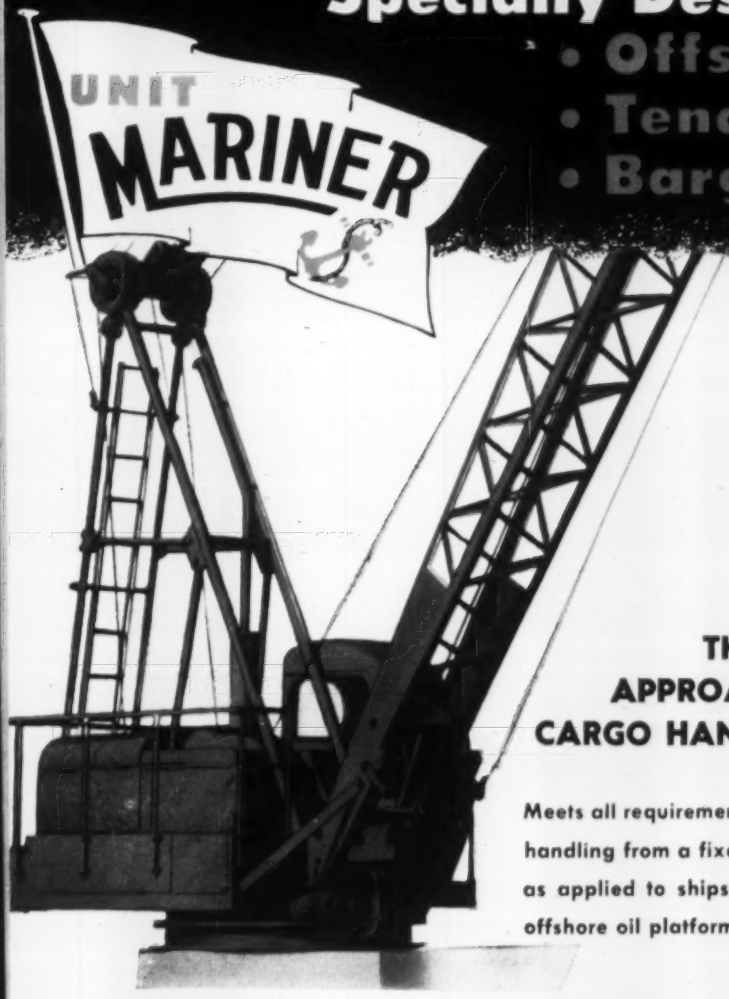
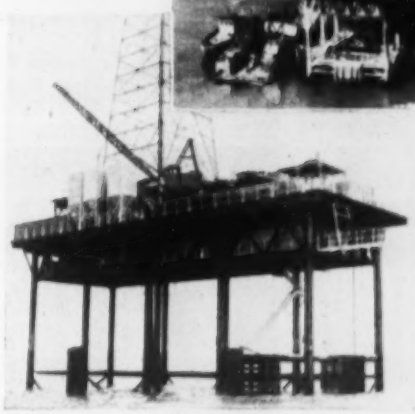


Designed to operate from a fixed mounting, the UNIT MARINER delivers dependable and economical performance aboard offshore equipment. Cargo is conveniently transferred from tender to platform.



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Meets all requirements for cargo handling from a fixed mounting as applied to ships, barges, or offshore oil platforms.

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Features incorporated in the MARINER design include: One-piece cast gear case — a protection against salt spray ● Self-aligning centerpost trunnion ● Turntable load rollers plus replaceable hook shoes ● Large diameter roller path ● Worm type independent boom hoist ● Large diameter swing brake ● Disc type clutches ● Straight-in-line engine mounting with torque converter plus many other important features. The LIFT and CONTROL ability of the MARINER permits loading and unloading with speed and accuracy. The full range vision safety cab enables the operator to see what he is doing at all times. Here's a machine constructed for your type of Cargo handling. Get the facts.

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MS-200 for Ships and Barges

The net results of converting from old type rigging: Speeds up cargo handling — reduces idle port time — cuts maintenance cost. These self-contained MARINERS operate independently of ship's power.

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Specify and Use

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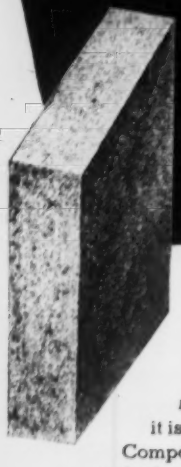

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CEMENTONE®

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2. **Fully resilient**
3. **Non-extruding**

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. . . Reader Comment

How to Cut Footing Costs

SIR—Regarding the article, "35 Ways to Cut Building Costs" (ENR July 5, p. 46), I was exceedingly glad that you included the drilled-caisson method of constructing column footings. Not only does this method save money and time, but the cast-in-place caisson has considerable more bearing capacity than the formed footing because of the bond between the sides of the caisson and the undisturbed earth.

For small buildings, the cost of wall footings can be reduced by using rectangular footings instead of the conventional inverted "T" footings. In constructing a rectangular wall footing, a ditching machine excavates to the desired depth, and the entire ditch is backfilled with concrete, thus eliminating forming and backfilling costs. Only the wall above the ground must be formed. Estimates for the Los Angeles area indicate a savings of approximately $2 per lin ft of wall for this type of construction.

Many engineers have a policy, "When in doubt, drive piles." Building costs could be greatly reduced if piles were specified only where they are absolutely needed. In the Los Angeles area, piles are often driven in dense, granular material and in soft bedrock, though the granular material and bedrock would support footing loads of 5 to 10 tons per sq ft with negligible settlement. In areas having poor foundation conditions, piles are often specified that do not transmit their loads to the bearing stratum; as a result, the structures settle the same amount as if they were on raft foundations. Before specifying piles every designer should consider the following points: (1) the need for piles, (2) the anticipated distribution of loads by the piles to the foundation strata and (3) the predicted settlement of the structure with and without piles.

CLAUDE A. FLIZER
Soil Mechanics Engineer
Los Angeles, Calif.

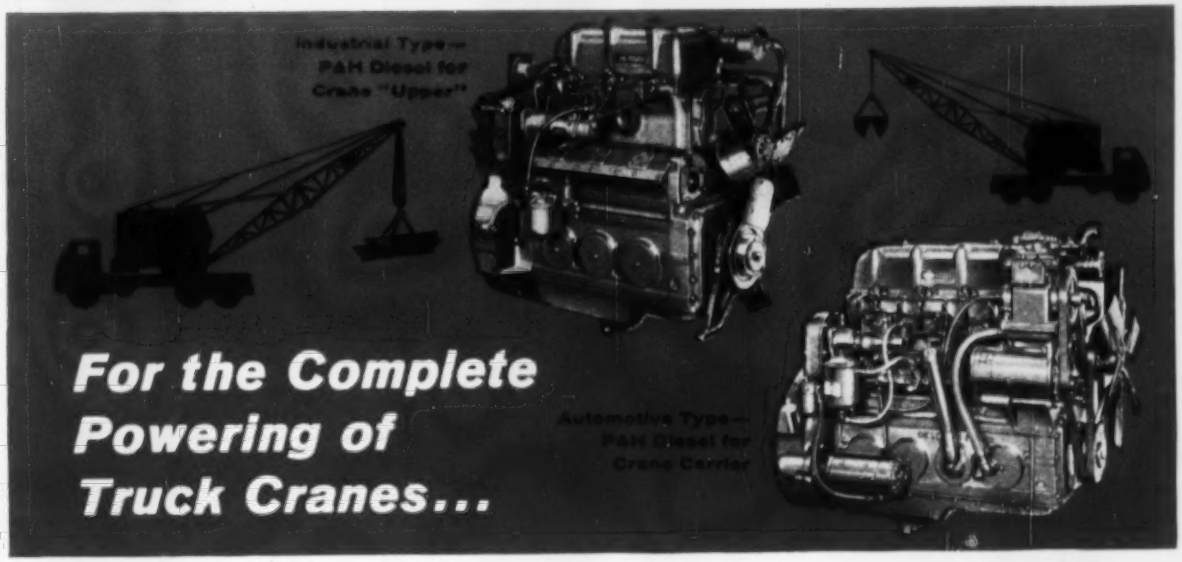
CALENDAR

Building Research Institute, Modern Masonry Conference, Hall of Flags, U. S. Chamber of Commerce Bldg., 1615 H St. N.W., Washington, D. C. Sept. 19-20.

Society for Experimental Stress Analysis, annual meeting and exhibit, Deshler-Hilton Hotel, Columbus, Ohio, Nov. 1-2.

Noise Abatement Symposium, seventh annual meeting, Hotel Sherman, Chicago, Ill., Oct. 11-12.

Sixth Annual Drilling Symposium, The University of Minnesota, Minn., October 11, 12, 13, 1956.



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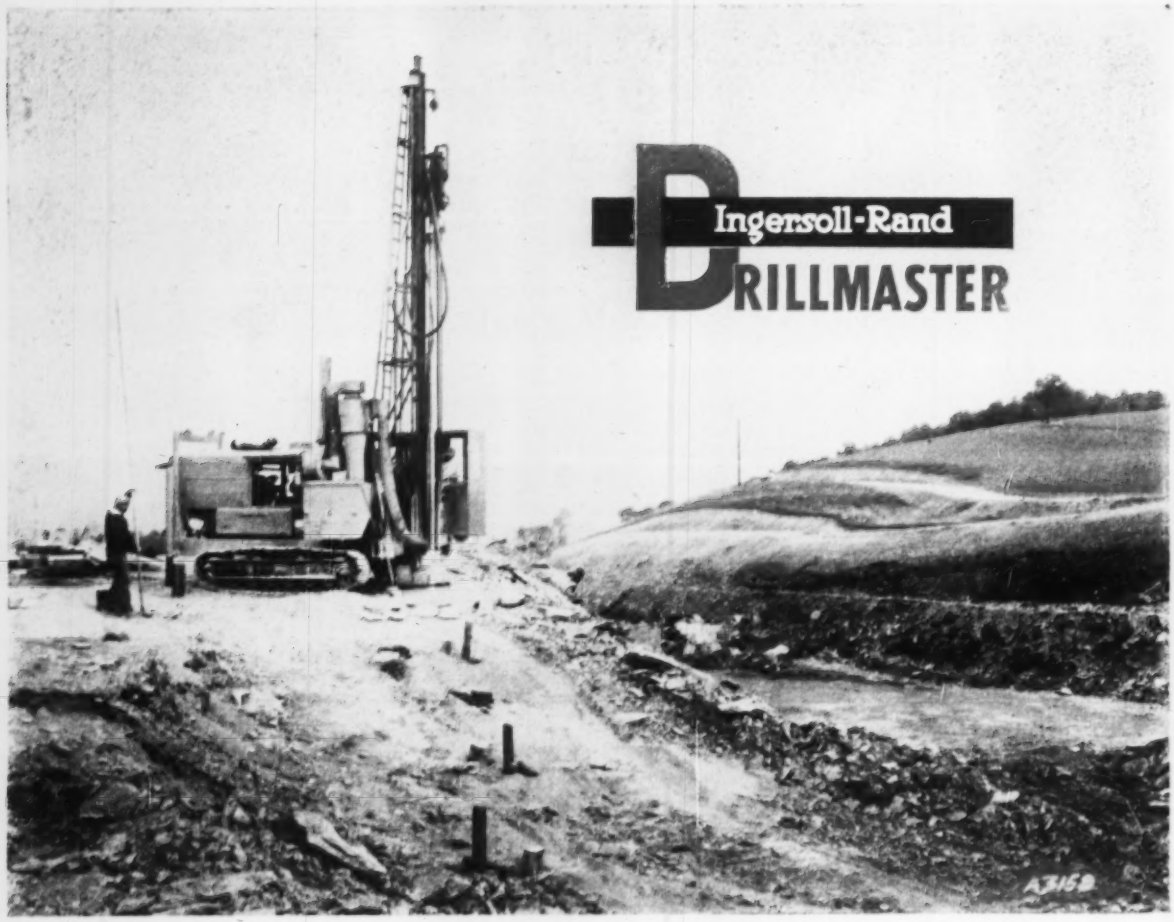

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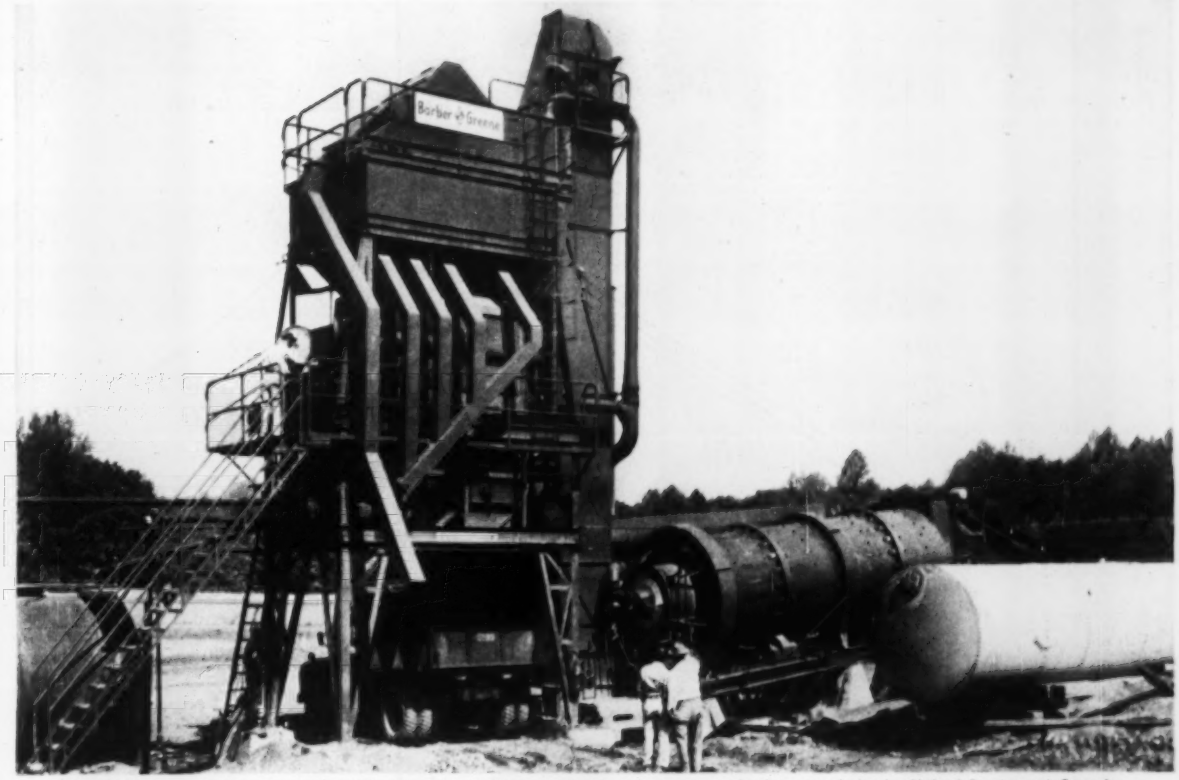

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ENGINEERING NEWS-RECORD

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Price 35¢ each copy except Annual Cost Issue. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

CUT-RATE FOR TRUCKERS—The New Indiana toll road, which will be opened to traffic Aug. 16, will offer an inducement to truckers right from the start. Firms having a credit arrangement with the Turnpike Commission will get a 10% discount on toll charges exceeding $2,000 in any one month.

BUT WHERE DOES IT GO?—Disposal of pulp mill wastes in central Oregon through laval faults into seemingly limitless underground caverns and lakes is under consideration by state authorities. State Engineer Lewis Stanley reports that the Oregon cities of Bend and Redmond dump raw sewage into such caverns without causing pollution in the nearby Deschutes River.

FLOOD CONTROL CAUSEWAY?—Latest in a series of suggestions to achieve a 14-mi crossing of lower Chesapeake Bay near Norfolk, Va., calls for constructing 13 mi of causeway broken by a one-mile tunnel to permit passage of shipping. The idea was advanced at a luncheon talk by Col. R. B. Warren, District Engineer at Norfolk—who cautioned that the proposal had not been evaluated from an economic viewpoint.

Warren's thought: Total cost (for causeway plus tunnel) might be $21 million. The causeway linking Cape Charles and Cape Henry could markedly reduce piling up of tidal waters at the bay's mouth in northeasterly storms or hurricanes—and storm-caused tidal floods have cost Hampton Roads communities millions of dollars in damages.

State legislators recently appropriated funds for study of a feasible crossing of the 14-mi bay mouth.

WATER POWER ON THE OHIO?—Public Service Co. of Indiana has applied to the Federal Power Commission for a permit to study the possibilities of a hydro plant at Markland Dam, a $74-million navigation structure now under construction 65 mi downstream from Cincinnati. It would be the first water power installation on the Ohio River. The Indiana utility is thinking in terms of an 80,000-kw plant.

LOUISIANA SETBACK—Gov. Earl Long's bizarre feud with the Louisiana legislature over fiscal matters has stalled a number of capital improvements. One casualty of the fiscal imbalance is the proposed $14-million tunnel under the Industrial Canal in New Orleans (ENR July 19, p. 28). However, the State Highway Department was instructed to proceed with planning. Among other projects for which legislative appropriations were vetoed are a $5-million bridge over the Red River at Alexandria and another costing $4.2 million over the Atchafalaya at Simmesport, and a $3-million traffic tunnel under the Intracoastal Waterway at La Rose.

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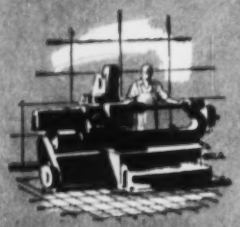

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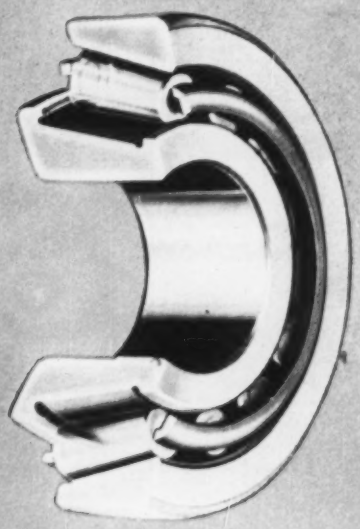

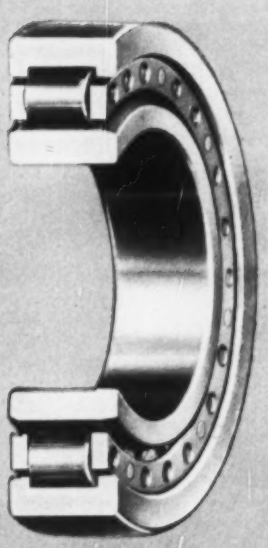

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WASHINGTON OBSERVER

Grudging compromise on public housing was the last big act of the 84th Congress before it adjourned.

No stickier problem in the broad construction field reared its head as congressmen went home this time, marking an end to the first four years of the Eisenhower Administration.

•

Eisenhower got a big victory in the housing law. The House gave it to him by flatly refusing to accept a Senate-passed bill that would have authorized 135,000 public housing units a year for the next three years.

The new program is 140,000 units—70,000 this year, the same next year. That's the exact number the President wanted.

•

There's some overall aid in the program for the homebuilders. Mainly, however, this aid is in the form of extending programs that would have lapsed this year without a new law.

A big one: Raising FHA mortgage insurance authority to $3 billion. The home fix-up program got a boost, too. It was extended for three years and the loan limit, now $2,500, was raised to $3,500.

There's more money for school construction in the so-called federally impacted area program. Congress approved for allocation to these areas, during this fiscal year, $142.5 million.

•

There could be more trouble about the military construction bill. The Senate refused to give up "veto" rights on contracts for military housing. The bill that finally went to President Eisenhower would require advance notice to be given to House and Senate Armed Services Committees before contracts could be awarded. Then Congress could bar a project by a simple vote.

Eisenhower is in a difficult position. He vetoed the original bill—which required advance Congressional approval of such projects. The new bill is similarly objectionable, but Eisenhower is in a disadvantageous position to turn thumbs down again—because Congress has gone home.

If he vetoes this one, two things could happen: (1) A serious delay in construction of military projects both in the U. S. and overseas; or (2) a call for a special session of Congress.

Best bet: Presidential signature with strong reluctance. Then, if the occasion arises, Eisenhower and Congress could fight it out on specific military housing projects.

•

The adjournment rush took the toll of some major power legislation:

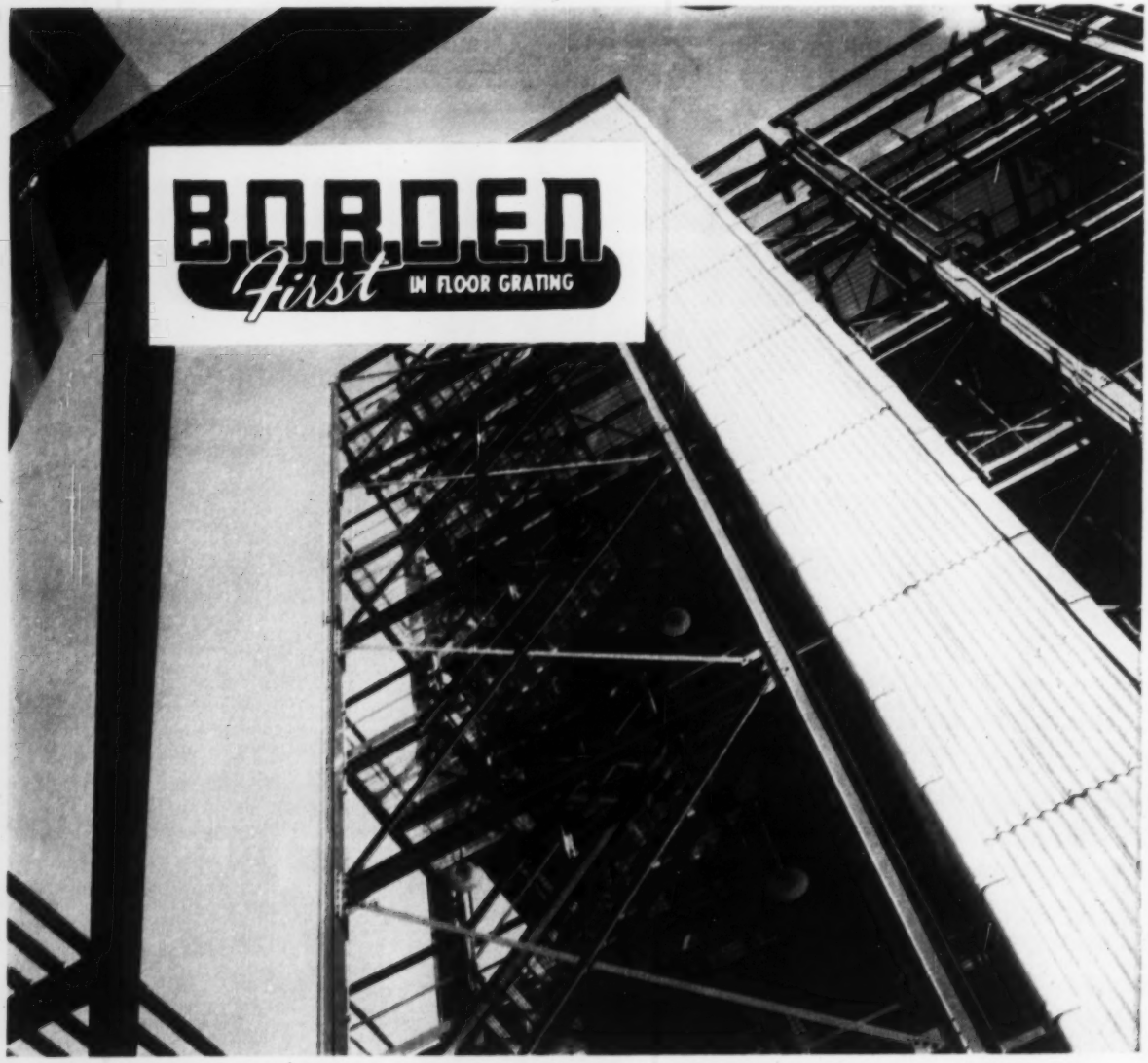
A federal high dam at Hells Canyon was defeated in the Senate; never got a chance in the House. The probable result: Uninterrupted construction by the Idaho Power Company of three low dams on the Snake River.

The Frying Pan-Arkansas water diversion in Colorado was pigeonholed.

Federal construction of atomic power plants was rejected. The Senate had approved a $400-million program, and the House Appropriations Committee okayed it. But the House, under Administration pressure, voted no.

•

Labor bills affecting construction failed on all but one count. Congress did, in the new highway law, bring federal-aid highways under the Davis-Bacon Law. Not acted on was the program of the building trades unions for the right to sign contracts requiring union membership within seven days of a man's hiring, and amendment of the eight-hour day law.



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IN WATER AND SEWERAGE SYSTEMS

An ENR status report on . . .

Automatic Controls: Next—Full Automation?

The big push is on for more automatic control of water and sewerage systems outside the treatment plant, but replacement of human control of quality inside treatment works is still the exception rather than the rule. This is how ENR reads the answers to queries sent to over 100 officials, consultants and equipment manufacturers.

Automatic control—often referred to as automation—has been hailed in the sanitary field as the coming means of attaining the highest quality end product through reducing or eliminating human errors. Yet automatic controls are farthest advanced and are being most readily adopted in the quantity end of the business—transmission and distribution, usually involving pumping.

There seem to be two major reasons underlying the present situation. The primary aim of sanitary men is to insure the quality of the treated product; they are somewhat reluctant to turn over control to machines. But, water supply and waste disposal must be handled on a business basis, so introduction of automatic controls is proceeding fastest in those areas offering the greatest potential for reducing costs—even where automatic controls enter the treatment works.

• Where Do We Stand?

At this time, the transmission, evaluating and control elements necessary for automatic control in water and sewage plants are all available. Reliable commercial sensing devices are offered for measurement of chlorine residual, pH, oxidation-reduction potential and conductivity, as well as pressure, temperature and fluid flow. Work is far advanced on devices to measure, on a continuous basis, turbidity (for coagulation control), fluorides, water hardness, and sludge density.

Eventually devices will be perfected for continuous measurement of BOD, bacterial content, ammonia content, and volatile acid content of sludge digestion tank liquor.

Today, it is apparent that sufficient devices exist to accomplish a great deal of automation in water and sewage plants. Indeed, many industrial processes similar to water and sewage treatment are completely automatic or very nearly so.

That waterworks are far behind industrial processes is probably attributable to the natural conservatism of water men and their first allegiance to insuring purity and reliability of product. But since it is this very purity and reliability that automation seeks to improve, automatic operation, including proper safeguards and alarms, will probably soon become firmly established in water plants.

On the economic side, industries able to automate their processes completely achieve considerable cost savings. Even in large water plants, little or no operating savings will be obtained by partial automatic control, so a factor retarding introduction of automation may be the lack of suitable sensing devices for several of the treatment steps peculiar to water.

Disposal works present a somewhat different picture. Sewage plants require, by and large, many more operators than comparably-sized water plants. Even partial automation—particularly telemetering of information from the many scattered buildings at medium and large plants—would seem to offer a considerable opportunity for cost reduction.

However, sewerage men have always considered their plants as "living entities" and, as such, defying the control of automatic devices. They are only beginning to separate the complex biological and chemical treatment steps (which are often difficult of even manual control) from the relatively well understood processes subject to remote and even automatic control.

Here is a phase-by-phase status report on automation in water supply and waste disposal as revealed by the ENR Survey:

• Pumping

A great majority of water supply agencies—and applicable sewage works—have installed or are considering installation of some form of automatic control in the field as opposed to the plant. At present, installations are mainly of the remote reporting (telemetering) type, bringing to a central point information such as flow rates, pressures and water elevations. Almost all of these systems include recording of the information. A good many agencies carry the process one step further and provide for remote control of pumping and, in a few instances even operation of valves. It is toward this point that large numbers of water systems and a few sewerage systems now appear to be moving.

Relatively few waterworks—perhaps two dozen—take the ultimate step of

. . . The steps toward full automation

complete and integrated automatic operation of low level, high level and distribution system pumps. Many individual pumping stations, of course, have long operated automatically, being actuated by float control or pressure variations.

Possibly the most notable of the automatic pumping stations is a Richmond, Va., plant that employs a combination of pressure and flow for control. Pumps are actuated by a pressure drop but are stopped on the basis of minimum flows—this to increase pump efficiency. An ingenious set of controls automatically cuts in and out additional units as demand requires. Since completion of this plant in 1948, only one failure has occurred, and that one right at the beginning of operation due to a careless oversight in construction. An older manually-operated pumping plant in the same city failed four times during the same period.

Other automatically controlled water pumping systems are located in Washington, D. C., Lubbock, Tex., Bristol, R. I., and Bristol, England.

In the sewerage field, the new treatment plant for the Allegheny County Sanitary Authority in Pittsburgh will receive telemetered measurements from all major control points in its collection system.

At two Los Angeles County Sanitation District treatment works, raw sludge is pumped into trunk sewers for subsequent digestion and disposal at another district plant. Automatic sludge draw-off, controlled by time-cycled electrically-operated valves, has been functioning satisfactorily. Pumping cycles can be varied in duration, and each cycle may be repeated at any interval up to 24 hours. It should be noted that sludge density control is not a vital factor in these installations.

In the water field, typical activity includes: Philadelphia's current $200,000 program to set up a central load dispatching system which will automatically receive and print information (pressures, water elevations in tanks and reservoirs) from 60 points in the system. Later, Philadelphia will then work toward remote control of pumps and valves.

Long Island Water Corp. (New York) utilizes telemetered information from 17 system pumping stations (a well supply) to override automatically operating individual stations with manual control from central headquarters.

St. Louis County Water Co. operates three Missouri River low-head intake stations—one of 100-mgd capacity—from their respective filter plants more than a mile distant. A 36-mgd diesel-powered main booster station is controlled from a point seven miles distant through a pair of leased telephone wires.

The picture is much the same throughout the country. The basic sensing and supervisory control tools to achieve completely automatic pumping systems are all available and in a relatively advanced state of development. Inside the treatment plant, however, is a different story.

• Flow Control

Water treatment plants have been built in recent years whose entire operation is controlled by water elevations in the clear well or in the elevated tank in the distribution system. Pumps, filters, sedimentation basins and chemical feed equipment are tied in with one or the other or both controls.

Examples are the Bristol, R. I. plant and the 12-mgd Broadside treatment works serving the city of Falkirk, Scotland. Indeed, the Falkirk plant is completely automatic except for required manual adjustment of dosages of lime, soda ash, chlorine and alum. Automation extends to filter backwashing—the phase of quality control most advanced in this respect.

• Filter Operation

Several automatic filter control systems are available today—and have been installed in a growing number of medium to small water treatment plants. They are fairly commonplace in industrial water plants. Filter backwashing can be actuated either when a predetermined loss of head is reached or on a time cycle. Backwashing cycles are usually time-controlled.

Probably the most advanced automatically operating filters today are those installed at the Scottish plant mentioned above. There, one "sequencer" controls washing of twelve filter beds and can accommodate eight more. The sequencer is actuated by an electrical signal from a differential pressure switch at each filter. Valves

Saturday Review

"My Gosh! I forgot to turn off the factory over the weekend!"

Just What Is This Thing Called Automation?

In simple terms, automation is a form of automatic control actuated by sensing elements feeding back to a control unit. The sensing element (in water and sewerage usage) is a device for measuring such things as pressure, flow, liquid level, pH, residual chlorine and conductivity.

Signals are transmitted or fed back from the sensing elements by any workable transmission system employing mechanical, pneumatic, hydraulic, electronic or audio-wave means. Evaluation of the feedback is performed by the usual meters and by digital and analog computers. These govern the operation of the control devices or actuators—the valves, pumps or mechanical feeders.

controlling inlet, upwash, washout and air on each filter are operated by high-pressure oil actuated by electrical solenoids connected to the central sequencer. The sequencer makes use of standard automatic telephone relays and special automatic timers.

The automatic wash cycle includes an air scour and a surface flush and automatic slow return of filters to service. A special automatic flow controller—which can be set remotely—maintains desired filter output regardless of head loss. A float-control device in a so-called slow-start control tank opens the flow controller gradually after each filter wash.

• Chlorination

Automatic control of chlorine dosage on the basis of residual chlorine as well as rate of flow appears to be just around the corner.

The residual chlorine recorder has been available for some time. In the last few years several manufacturers have been perfecting the connection between the recorder and the chlorinator.

At least one commercial model employing an electronic controller, is now being plant-tested.

• pH Control

Automatic control of pH is commonplace in industrial processes, but is utilized in few municipal water works—most probably because the problem of varying pH is usually not serious and little economy is gained by the automation of just one step in the treatment process.

However, the 22-mgd Winston-Salem, N. C., waterworks does have a problem with unusual variations in pH (6.6 to 10.3) due to drawing water from two sources—a river and a lake. An electronic pulse-time controller installed with a pH recorder at the filtered water clearwell now regulates the time cycle of a gravimetric lime feeder. It had been expected that automatic control would produce a filtered water varying no more than 0.2 pH from 7.0. Virtually no deviation is being obtained.

• Coagulation

The only major obstacle remaining before complete automation of water plants is theoretically possible is development of a reliable and reasonably priced sensing element to measure turbidity and thus to enable automatic control of alum or other coagulant feed.

Control of coagulation on the basis of pH doesn't appear to be the answer, but several industrial processes employ infra-red spectrometers to measure and control clarity of liquids. Research is being pushed in an effort to relate the latter serving element to addition of alum and other coagulants. Studies are also under way on the possibility of using conductivity measurements in order to control coagulation.

Conductivity measurements are also being employed to control fluoridation automatically at several installations. Water conductivity is measured before and after introduction of the fluoride agent.

• Sludge Pumping

A fair number of sewage works automatically control in-plant sludge pumping on a time cycle. But such control has often been found wanting because of the greatly varying rates of sludge accumulation in sedimentation tank hoppers with consequent clogging of lines and uneven rate of introduction into the digesters.

One device that can sense sludge densities with remarkable accuracy (utilizing radioactivity) is available but at prohibitive cost. Development of a less expensive sensing element will make reliable automatic control of sludge pumping feasible.

The Los Angeles sanitation districts are now investigating control of sludge pumping cycles by electrical relays actuated by variations in motor current required.

• Other Sewage Applications

Many activated sludge plants utilize flow meters to sense ratios of air to sewage and of return sludge to sewage, thus enabling the operator to adjust flows manually. The adaptation of such arrangements to automatic control—a relatively simple step—is foreseen, although much remains to be learned about the activated sludge process.

Automatic control of sludge digestion and vacuum filtration is at this time only a gleam in the eyes of sanitary engineers. Before adequate sensing elements can be developed much still must be explained about the complex biological and enzymatic reactions involved in these processes. Screening and skimming of grease are seen controlled automatically on the basis of load.

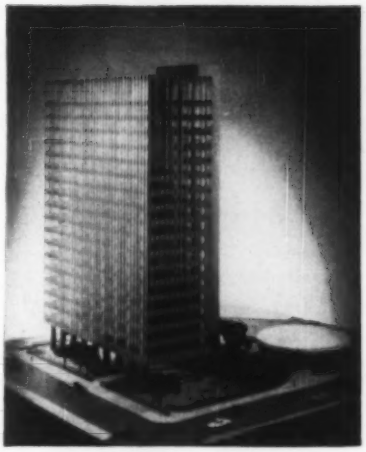
• Personnel Problem

One not surprising growing pain accompanying introduction of automatic controls in water and waste systems is the difficulty that present day operators and maintenance personnel have in keeping the devices in operation (several works officials intimate they are more trouble than they are worth). This should not be too serious a drawback as personnel become more familiar with the new devices and the devices themselves are improved.

• Where Do We Go?

Carried to its logical conclusion, complete automation of water and sewage works will involve automatic analyzers and computer mechanisms in the laboratory. Safeguards, including electronic eyes, X-ray microscopes and closed-circuit television, will also be necessary.

Few people will venture definite predictions as to how fast all this will occur. But a safe statement is that complete automation in water and waste water systems will eventually be the only acceptable standard.



New Glass-Walled Building

Exterior of the 20-story headquarters office building to be erected for Crown Zellerbach Corp. in San Francisco will be all glass. The glass windows and spandrels will be set in aluminum frames fastened between aluminum mullions.

Foundation for the steel-framed structure will be an 8-ft thick concrete mat 30 ft below street level. Columns will be placed only around the perimeter of the 200x70-ft floors. Elevators and utilities will be in a concrete-enclosed section projecting from one side of the building. The design assumes earthquake forces will be resisted by the column and floor system with substantial help from the utility core.

Demolition of buildings now on the site was started in mid-July by Joseph D. Ballinger & Co., Oakland. The building was designed by Hertzka & Knowles, and Skidmore, Owings & Merrill, associated architects. Henry J. Brunnier is the structural engineer.

Pike Power Shift

Highway agency takes over control on Penn Pike

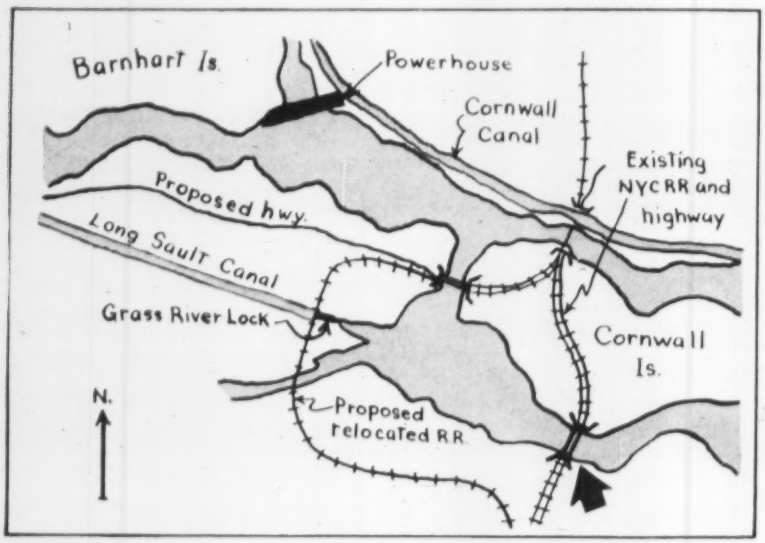
Wasting no time in taking advantage of a ruling by the state attorney general, the Pennsylvania Department of Highways this week assumed responsibility for construction of a proposed 46-mi Pennsylvania Turnpike section in Erie County.

The Highway Department said that it would build the section—which would link the New York Thruway running southwest from Buffalo to Erie to a proposed Ohio Turnpike extension—as a free road.

The department acted on instructions from Gov. George M. Leader, after Attorney General Herbert B. Cohen ruled last week (ENR July 26, p. 17) that the department has jurisdiction over all turnpike plans, maintenance and right-of-way acquisition. Observers at Harrisburg said that Cohen's opinion, in effect, strips the Turnpike Commission of all powers except policing, financing and toll collection.

While announcing the takeover of the proposed road, Highways Secretary Joseph J. Lawler said he will press for "reimbursement" of $1 million which the department advanced to the commission in 1953 for preliminary studies of the Erie link. Lawler commented that the commission last May, had requested another $1 million for further planning of the proposed $65-million extension but that he had withheld the money "in the absence of any information that the toll extension would pay its way."

Meantime, opposition, political and otherwise, was developing against efforts of the Democratic state administration to dominate the Turnpike Commission. State Senator George N. Wade, a Republican and chairman of the Senate Highways Committee, said he would sponsor legislation when the legislature convenes in January "to keep maintenance of the Pennsylvania Turnpike where it belongs, with the Turnpike Commission."



Trouble on the St. Lawrence Project?

Decision of the St. Lawrence Seaway Development Corp. (U. S.) to build a high-level suspension bridge (arrow) across the south channel of the St. Lawrence River threatens the scheduled July 1958 opening of the power and navigation projects, according to Robert Moses, Chairman of the Power Authority of the State of New York.

The Seaway Corp. on July 19 announced the suspension bridge plan in lieu of a previously approved (by all St. Lawrence construction agencies) scheme to relocate the New York Central Railroad tracks and a highway to Cornwall, Canada, as shown on the map. The relocation plan requires two major bridges more than 1,000 ft long spanning Grass River and the so-called Polly's Gut in the St. Lawrence as well as the building of a short bascule or lift span over Grass River Lock.

Failure to complete the suspension bridge on time—and PASNY believes this is impossible since the Seaway Corp. is only at the boring taking stage—will prevent navigation from using the 27-ft-deep Long Sault Canal and south channel around Cornwall Island since the existing low-level bridge (at the arrow) would have to remain in operation. Navigation would have to continue using the 14-ft Cornwall Canal which would prevent filling of the power pool behind Barnhart Island powerhouse since several locks on the Cornwall Canal would be flooded out.

The Seaway Corp. has not yet given reasons for its sudden change in plans. Presumably the new plan is less expensive, in view of a possible abandonment of its rail line into Canada by the NYCRR.

N. Y. Port Group to Build $7.7 Million in New Terminals

In two actions designed to make good on its commitments to the city of Newark, N. J., the Port of New York Authority last week began moving toward further improvements of Port Newark—a vital sector of New York Harbor.

The two actions were the acquisition of 32.66 acres of land under water in Newark Bay from the state of New Jersey and the announcement of plans for construction of a $6.1 million, three-berth terminal and a $1.6 million cargo terminal at Port Newark. PNYA operates the port under a 50-year agreement with Newark.

The three-berth terminal will be located on the eastern section of an area formerly controlled by the federal government. It will consist of three aluminum-sheathed terminal buildings, 520 ft long and 175 ft wide, served by a 58-ft wide wharf along the channel. The cargo building, also to be aluminum walled, will be 440 ft long and 200 ft wide.

Since taking over in 1948, PNYA said it has now committed or spent $40 million on port improvements.

Pollution Charge May Close $25-Million Washington Mill

Rayonier, Inc., may be forced to close its $25-million pulp mill at Shelton, Wash., to comply with a Washington State Pollution Control Commission order to halt disposal of untreated waste into Puget Sound. Rayonier has asked the commission for a hearing on the ruling, asserting that all except 3% of the sulphite waste is eliminated by burning.

The order came as somewhat of a surprise since E. F. Eldridge, director of the commission, declared several months ago that the Shelton plant had the "best, most complete disposal method of sulphite-liquor of any mill in the country."

The commission's order came following complaints of oyster growers that their oyster beds were being destroyed. Winston Scott, resident manager of the facility, has said that there is no way of substantially reducing the amount of sulphite-waste liquor discharged from the Shelton mill except by ceasing operations.

Why No Irrigation?

Eastern farmers said to require water rights law

Lack of specific legislation governing consumptive water use rights is keeping farmers from making use of irrigation in many eastern states, according to New York State Senator F. E. Van Lare of Rochester. Pointing out that 70,000 farmers in his state are now making use of supplemental irrigation, Van Lare noted that agriculture has not matched the water claims of industry and municipal agencies in a number of northeastern states. The reason for the farmers' reluctance to invest in irrigation, he said, is the lack of legislation enabling them to establish legal claim to a definite amount of water.

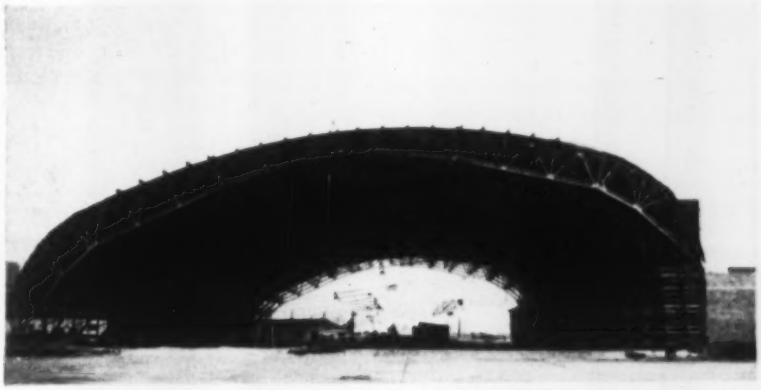
The occasion for Van Lare's remarks was the First Northeastern Conference on Water Rights Legislation, Irrigation and Small Watershed Development, sponsored by New York State's Joint Legislative Committee on Interstate Cooperation. Experts represented Vermont, Massachusetts, Rhode Island, New Jersey, New York, New Hampshire, Delaware, Pennsylvania and Connecticut at the one-day meeting in New York City last month.

Part of the session was devoted to a discussion of the problems of drafting laws for water resource regulation. Joe C. Barrett, who represents Arkansas on the Council of State Governments and is chairman of the Uniform Law Commission, declared that insistence that a definite choice be made between the traditional riparian rights approach to water rights or the apportionment system based on purpose and date of initial use, employed in the West, is fallacious. The best solution, he said, often lies somewhere in between, through a state's use of the licensing power.

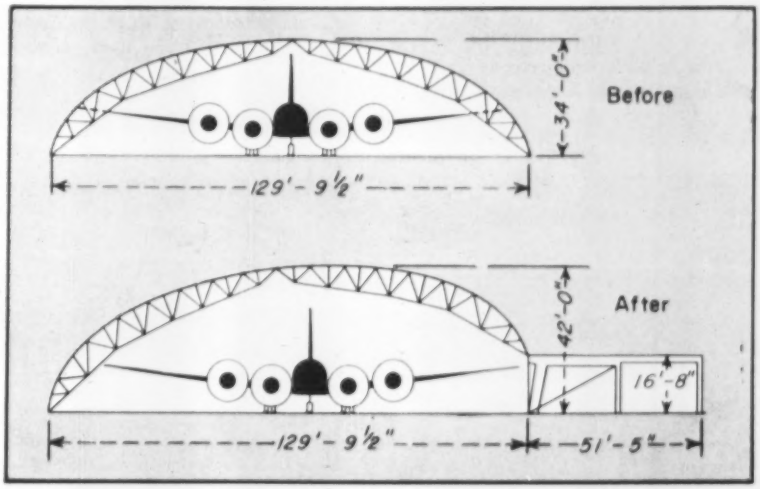
Electronic Team to Size Worst Possible Ohio Flood

With the aid of an electronic differential analyzer and a digital computer, the Ohio River Division of the Corps of Engineers hopes to find out just how big a flood could occur in the Ohio River if conditions were at their worst. Correlation of hydrology records may lead to a revision in the basic plan of flood control.

Using records of 15 floods and 50 rainfall periods, the computer system will convert the rainfall figures into runoff volumes, making proper correction for topography and absorption characteristics. Scope of the task involves some 5,000,000 calculations.



JACKED-UP 17 ft at one side, hangar now has room for DC-6s and DC-7s. Cribbing and tie cables won't be needed after a 52-ft wide lean-to is finished along high side.



CROSS-SECTIONS, with superimposed DC-7 silhouettes illustrate the inadequate clearance before and the snug fit of the plane after the hangar was raised.

Tilted Hangar Adds Space for New Planes

To provide additional clearance required by new DC-6 and DC-7 aircraft, an existing 130 x 320-ft barrel-shaped hangar at Newark Airport, N. J., was tilted up about one side. The raised edge, temporarily resting on timber cribbing, later will be supported by a maintenance building now being added. The 17-ft lift (ENR Dec. 22, 1955, p. 15) was finished in two weeks.

The operation increased the center height from 28 to 37 ft and added sufficient height elsewhere to clear the wings of newer aircraft. Wingspan is 117½ ft for the DC-6 and DC-7.

The hangar roof is carried on 17 three-hinged, trussed steel arches spaced 20 ft c-c. The horizontal reaction of the arches was taken originally by tie rods under the floor and during jacking by 1-in. steel cables connecting the arch ends.

Lifting was accomplished with hydraulic jacks under each trussed arch, operated in three banks (6, 5 and 6) from a central pumping station.

As the hangar was slowly tilted, the 6 x 8-in. timber cribbing was placed under the arch ends.

A 52-ft wide, 17-ft high maintenance structure now is being built along the length of the jacked edge. It will house workshops, offices, lounge and other facilities. The structure will be a wood-frame, two-bay-wide addition, with the first bay designed to take the reaction from the hangar edge.

Diagonal steel members in the new bents will transmit the thrust of the raised arch ends to the original tie rods so that horizontal reactions at opposite ends of the arches will still balance one another.

Newark Air Service, Inc., operates the hangar, which when completed will be able to handle two large planes and several smaller ones at the same time. New Jersey Erectors, Inc., contractor, did the tilting. Engineers Co., Inc., Newark, planned the project. Iorio Construction Co., Newark, is the general contractor.

Water Sale

New York to sell 70-mgd Long Island water supply

New York City last month announced that it will sell its Long Island water supply facilities to Nassau County. The announcement was greeted enthusiastically by Nassau County officials, who had requested the proposed sale at a conference of metropolitan regional representatives held in New York on June 18.

The question now—and it's a big one—is how soon the 23-mi long system of wells, good for 70 mgd, can be turned over to the county. According to Francis Clark, chief engineer of the NYC Department of Water Supply, Gas & Electricity, the system will be sold in two sections, the first extending out to Freeport, L. I. Before the well system, now used to boost pressure in the Rockaway area during hours of peak demand and as a stand-by supply for the Borough of Queens, can be sold, two steps must be taken.

First, the Delaware Aqueduct must be completely dewatered and cleaned of accumulated silt and debris deposited by Rondout Creek water prior to the completion of the Rondout Reservoir. Start of this job awaits establishment of labor rates between contractors and labor officials in the Newburgh, N. Y., area. Upon completion of clean-up operations, the first half of the Long Island system is scheduled to be released for sale to Nassau County.

The remainder of the well supply is to be released after $4 million to $5 million worth of trunk mains in Queens are laid. The new pipe is necessary since the sale of the Long Island system will eliminate the borough's present stand-by facilities.

Both city and county will benefit from the transaction. For the city, which may be $70 million richer from the deal, it will mean the end of half-million dollars worth of annual overhead on a seldom-used utility. The county will obtain long-term relief from a currently critical water supply situation.

Swift Settlement

Agreement is reached on hydro development

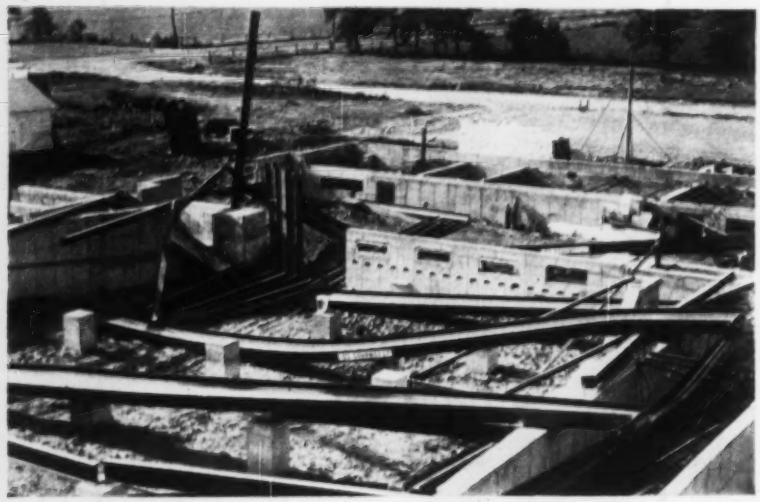
Agreement on a joint development program for the upper Lewis River in the Pacific Northwest was reached last week between Pacific Power & Light Co. and the Cowlitz County Public Utility District, following four months of negotiation.

The district is to pay 26% of the cost and obtain 26% of the output of the $56.7-million, 256,500-kw Swift hydroelectric project now being built by PP&L, and the district and the company will share on an agreed basis in any new projects that may be developed upstream.

At the Swift project, Pacific will build and own the main dam and powerhouse, having a rated capacity of 189,000 kw; the PUD will build and own No. 2 powerhouse 3½ mi downstream, where there will be a 67,500-kw generating installation. The district's investment in the project will be approximately $15 million.

Construction crews are now drilling the river diversion tunnel at the main dam site and the entire project is slated to be in service late in 1958.

Under the agreement, the PUD will join with the company in requesting the Federal Power Commission to issue licenses to Pacific for Swift No. 1 and to the district for the No. 2 plant. The district's pending protest to issuance of a license to the company will be withdrawn.



Clue to Erection Failure Sought

A nudge by a crane boom and inadequate bracing during construction may have contributed to the July 13th collapse of the partly erected steel framework of an auditorium near Columbus, Ohio.

The mishap, which occurred while workmen were installing roof purlins on the 68 x 90-ft, one-story steel-frame structure, brought down four 68-ft, 36-in. deep girders and eight 36-ft long columns. Damage was estimated at $15,000 to $20,000.

John W. Bennett, vice president of Kent Bros. Co., the general contractor, said that it had been determined that a crane boom struck the framework. He also disclosed that the structure was not guyed on the side where the crane was working.

Two inspectors of the Ohio Division of Factory and Building Inspection reported after a special investigation that the cause was "undetermined." They also said all sections of the structure had been temporarily bolted before the accident.

Prof. Hamilton Gray, of Ohio State University's civil engineering department, stated that none of the fallen steel can be re-used. Gray was retained by Kent Bros. Co. after the crash.

One workman was injured trying to leap to safety when the structure collapsed. Another slid safely down a crane boom.

Although replacement steel won't arrive till early next year, the 1,000-seat auditorium can still be completed on schedule by late 1957, Bennett said. The auditorium is part of a $403,000 addition to Franklin Heights High School, in Franklin Township.

Jacksonville to Start on $100-Million Sewerage Plan

First stage of a long-range $100-million sewerage system for Jacksonville, Fla., has gone under design. The initial work will consist of sewers and will cost about $13 million.

The city may be forced into early construction of treatment facilities as state health authorities have pointed to increasing pollution of the St. John's River which receives Jacksonville's sewage.

Metcalf & Eddy of Boston, and Reynolds, Smith & Hills of Jacksonville planned the comprehensive disposal program.

Public Health Service ready to wield . . .

The Big Stick Against Pollution

Chemical, paper and pulp and other wet process industries will find their water pollution problems the subject of increased attention in the months ahead from both federal and state officials. Official attention—on a far broader scale than ever before—is due as the U.S. Public Health Service gears up to carry out its increased functions under the new Federal Stream Pollution Control Act.

The heightened impact of the governmental program will begin to be felt in September when Public Health Service expects to start a new flow of money to beef up state and interstate pollution control agencies. At the same time, PHS hopes to get moving on a broadened program of economic and scientific studies and research and technical assistance—aimed particularly at the process industries.

• More Operating Money

The new non-expiring Federal Water Pollution Control Act which took effect July 1 is a far broader measure than the 1948 law it replaced. The latter cost $1 million to operate last year. Last week Congress voted $4.2 million for PHS operating funds, a figure disappointing to Health, Education and Welfare Secretary Marion Folsum who had strongly urged a $7.7-million budget. In addition, the full $50 million authorized for grants-in-aid for sewage works construction has been appropriated by Congress.

The heavier outlay will be used to carry out the half-dozen new responsibilities authorized by Congress.

$2 million a year for five years in matching grants to state, interstate and territorial pollution control agencies will step up all phases of pollution control activities. These agencies now spend about $4 million a year of their own funds. With the matching principal, their expenditures for water pollution control—mainly enforcing state anti-pollution laws—should hit the $10 million a year level.

• Expanded Research

Congress appropriated an additional $350,000—instead of an extra $1.3 million requested—for a broadened research program. The lower figure means that $1 million of planned grants, contracts and fellowships to universities and other institutions will be put on ice until next year.

Marked for more federal research funds is development of methods for evaluating in dollars and cents terms beneficial results of pollution control on an area's economy. These methods could lead to setting a value on pollution cleanups in terms of attracting new industry and the tourist trade, and raising property values.

To collect basic pollution and health-related chemical, physical and biological data, PHS hopes to spend $250,000 on pulling together: a national water quality basic data program related to sewage and industrial waste pollution—complementing the U. S. Geological Survey's data on natural chemical content of water; a complete national inventory of sources and types of pollution and of domestic sewage and industrial waste facilities; and detailed basic data related to the economics of water supply and pollution control.

• Federal Enforcement

New enforcement powers granted to PHS will spark a crackdown on polluters of interstate streams. The agency plans to use $250,000 this year to investigate "the more urgent" complaints—many long-standing—submitted by state agencies, cities and private groups.

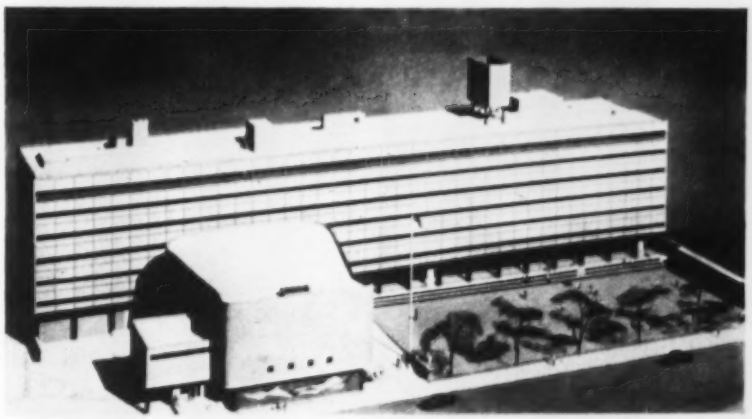
PHS figures $40,000 will give it a start on drawing up an inventory of pollution discharged by arsenals, prisons, military bases, hospitals and other federal installations.

PHS has some concrete plans for field studies for stepping up its handling the mounting request for industries, state, interstate and other federal agencies for expert personnel to look into unusual and difficult pollution problems. The agency plans to spend about $120,000 to beef up its task force working out of Cincinnati on these problems. Examples are petroleum refinery waste disposal problems at Baton Rouge, La., a grasslands filter study of the treatment of beet sugar wastes at Bayard, Neb., an algae conversion project at Richmond, Calif., involving recovery of nitrogen values of sewage by converting the sewage to algae cell protein, and a survey of radioactive wastes discharged into the Savannah River.

• Grants-in-Aid

To handle the ten-year, $500-million grants-in-aid program, PHS will spend about $400,000 to hire 100 additional technicans and office workers to help process the 1,000 or more grant applications it expects this year.

The agency has drawn up regulations which the states must use in certifying these projects, but it believes that many states will need help in handling the load of applications—making the necessary determination of the importance of a proposed construction project and the city's need for outside financial help.

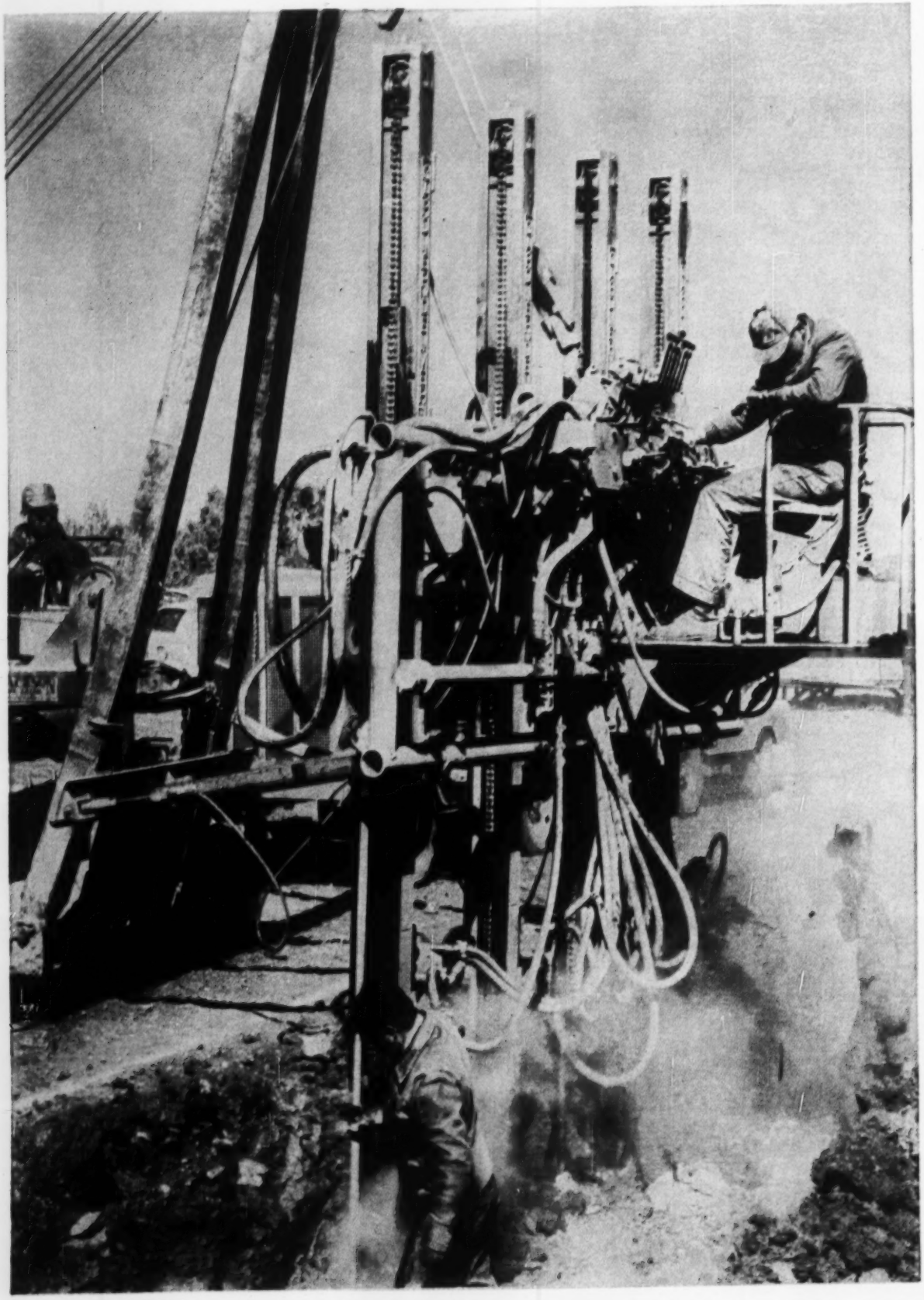


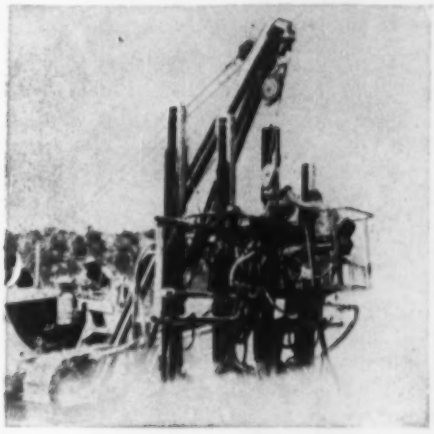
Colored Glass Blocks Enclose School

The seven-story, 400-ft long New York School of Printing, now under construction in New York City, will be walled with a newly developed glass block and glass vision strips at each floor.

Manufactured by Pittsburgh Corning Corp., each block contains a blue-green fibrous-glass diffusing screen. It has about 35% less brightness and 25% less instantaneous heat gain than standard block, the manufacturer says. Also, interior prisms refract light upward, bouncing it off the ceiling to improve lighting at the rear of classrooms.

Kelly & Gruzen are the architects for the $6-million school.





Gardner-Denver "Quadril" drills four holes at a time, to 6' depths, in less than three minutes through malapai.

Heart of El Paso Natural Gas Company's giant $195 million expansion program is a 339-mile, 34" I.D. pipeline. To link Farmington, New Mexico, with Topock, Arizona, this latest "Super-Inch" must be laid in machine-killing country. Here, as on so many tough jobs, the construction chiefs . . .

Count on Gardner-Denver to drill solid rock . . . fast!

About 85% of the pipeline route passes through tough malapai. Construction men call it "one of the largest rock pipeline jobs in the country to date."

The drilling goes on in mountain snow and searing desert heat. Rivers must be crossed, and grades of 45° conquered. Progress on an average day is 1¼ miles—which requires the drilling of 2200 holes.

Gardner-Denver is on the job:

8 Gardner-Denver RP600DA Rotary Compressors

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Gardner-Denver S58 Sinkers & B67 Breakers

Gardner-Denver DH99-141 Ring Seal Shanks

Gardner-Denver CL5-608B Sectional Rod

Gardner-Denver CL5-600 couplings

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Forecasting Construction Markets

Critical shortages and slow deliveries of key materials and some types of equipment are hampering the construction industry for the second straight year. This situation is the result of the extremely rapid increase in new construction, plus record maintenance and repair activity, which have strained supplies and flooded many manufacturers with orders well in excess of their capacity to produce.

Better forecasting could have helped the construction industry avoid these bottlenecks through advance planning for peak demands. The difficulties are that construction contracts and expenditures are hard to forecast, and it's even rougher to foretell how much demand they will generate for many types of construction materials and equipment.

However, there's a large volume of construction market information available to the industry's forecasters. Some of this is compiled and reported by Engineering News-Record; some is available from government and industry sources. Considerable progress toward better forecasting is possible by shrewd use of these available data.

The following series of articles shows some of the ways to attack the forecasting problem. These methods may help point the way for others in developing systems of their own.

The Correlation Method

• Sales forecasting

William G. Potter
Consulting Sales Forecaster

If you're selling to a cross section of a broad market, you can tackle your sales forecasting problem by exploring available economic indicators. By means of correlation, you can measure how changes in your sales relate to changes in various overall economic indicators. Then, selecting those indicators having the closest relationship, you can use forecasts of what they will be to predict what your sales may be.

This is the attack used, for example, by American Air Filter Co., Inc., Louisville, Kentucky, which makes industrial and commercial air filtering, dust collecting, heating and ventilating equipment. The result has been a forecasting method that is proving to be of real help in making an accurate annual company sales forecast.

The company compared its sales as far back as 1923 with several economic indicators and found that its sales correlated closely with these indicators: Gross National Product; Durable Goods Industry Sales; and ENR Construction Contract Awards (see charts on facing page). These "scatter charts" are simply a plot of annual company sales on the vertical scale versus the particular economic indicator (horizontal scale) for each year.

If all points in a scatter diagram were to fall on a straight line (or smooth curve) the correlation would be perfect. However, this is unlikely to happen in practice when

correlating sales of a particular product with an overall economic indicator. Therefore, the problem is to find the line (called the "regression line") that best fits the points in describing correlation between sales and the indicator.

Some judgment is required in deciding what shape this line should be—straight, curved, "S" (growth) or what. Inspection of the scatter diagram should indicate the shape of line that fits the points best. In the case of the charts shown here, the relationship is best described by a straight line. The "regression line" as drawn in each chart was calculated by the "least squares" method, meaning that the sum of the squares of all the vertical distances between points and the line is less than for any other line drawn among the points. Textbooks on elementary statistics give the reader more discussion on the various types of lines which can be used to describe the correlation, and how these lines are calculated from the points in the diagram.

Having determined the regression lines, the next step is to obtain forecasts of the economic indicators for the next year (1956). Last October, ENR's preliminary forecast of 1956 Construction Contracts was $19.1 billion (upped to $20.0 billion in ENR Feb. 16, 1956, p. 56). Durable Goods Industry Sales were forecast at $170 billion in 1956. Similarly, Gross National Product is currently being forecast by most economists at $400 billion during 1956.

Sales of American Air Filter corresponding to each of these indicators' forecasts are shown in the charts. All three charts point to 1956 sales in the neighborhood of $32 million. With this figure, American Air Filter management has been able to get a feel of the 1956 sales outlook, and relate the forecast of sales volume to available plant capacity, manufacturing costs and potential profit.

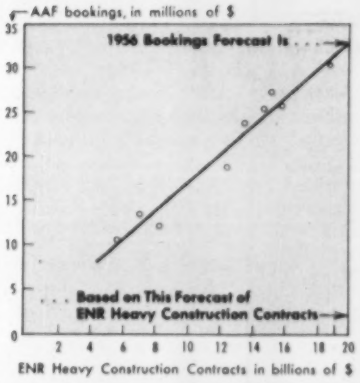
• Selecting indicators—Any firm with a sales history extending over at least five years may find the correlation approach to forecasting useful. Judgment is required to choose indicators with which its sales have a logical and meaningful correlation. If sales of a firm correlate with the number of Christmas trees sold annually, the results are probably coincidental and meaningless. On the other hand, correlation with any of the many construction industry indicators is probably of real significance.

Firms selling to a national market can choose indicators from an increasing selection which are being reliably forecast. To name a few and their source:

The Correlation Way:

Hooking your new business to overall business indicators by correlation helps you to forecast your own new business from forecasts of the indicators.

American Air Filter bookings correlate closely with three overall business indicators. The consensus of the three separate forecasts is the key to expected bookings.


AAF bookings, in millions of $
1956 Bookings Forecast Is . . .
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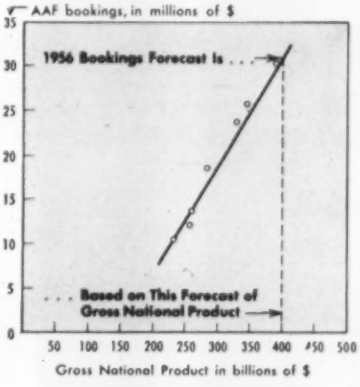
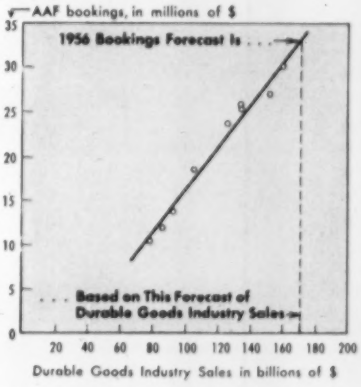
ENR Heavy Construction Contracts
ENR Heavy Construction Contracts in billions of $


AAF bookings, in millions of $
1956 Bookings Forecast Is . . .
. . . Based on This Forecast of
Gross National Product
Gross National Product in billions of $


AAF bookings, in millions of $
1956 Bookings Forecast Is . . .
. . . Based on This Forecast of
Durable Goods Industry Sales
Durable Goods Industry Sales in billions of $

1. Construction contract awards—ENR
2. Expenditures for new construction put in place—Dept. of Commerce-Bureau of Labor Statistics.
3. Housing starts—Bureau of Labor Statistics
4. Business expenditures for plant and equipment—McGraw-Hill Dept. of Economics; also SEC-Commerce
5. Gross national product (Total U. S. output of goods and services)—Dept. of Commerce
6. Durable goods industry sales—Dept. of Commerce
7. Defense spending—Dept. of Commerce
8. U. S. population—Dept. of Commerce, Bureau of Census

Finding dependable forecast indicators for a particular limited geographic area is more difficult than for the national market. However, some of the construction indicator forecasts are divided into geographic areas, such as New England, Middle South or Northwest. Regional trade journals, chambers of commerce, state departments of commerce or state college economic bulletins often contain reliable indicator forecasts for their limited areas.

• Reliability—The best correlation graph is no better than the reliability of the economic indicator forecast. How do you know if a forecast of an indicator is reliable? Simply by checking its past history. No indicator forecast is 100% reliable, but they represent the best thinking of experts in the particular field. By using correlation results from several different indicator forecasts you can obtain a consensus. This reduces the danger of relying solely on the forecast of one indicator. American Air Filter normally investigates the correlation graphs of at least three different indicators in order to obtain a consensus.

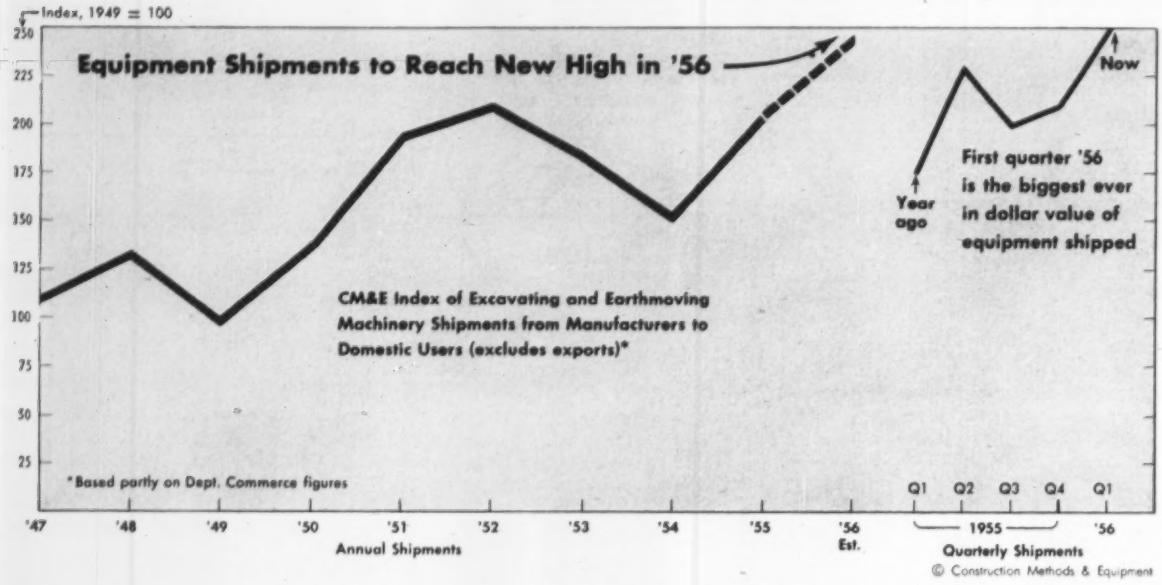
Finally, just because a correlation has been successful for 20 or 30 years doesn't mean that it will be true the next year. The factors that cause correlation can be upset, especially by changes within the company organization. A fast-selling new product or a competitor's new product can upset the correlation. It takes a "feel" of the company's market, which most managers should have, to sense competitive or economic changes that could disrupt a long standing correlation.

As a further precaution against such an upset, American Air Filter normally develops independently a company sales forecast using an entirely different approach—each product manager compiles his product forecast and these are added into a total company sales forecast. In this way, one method of

forecasting company sales provides a check on the other.

• **Other uses**—After gaining familiarity and confidence in forecasting by correlation, its use can be expanded to forecast raw material costs (correlated, for example, with national steel consumption) or labor costs. In fact, use is limited only by the availability of reliable forecast indicators.

But no matter what the end use of the forecast, it is important to remember that the correlation method or any other forecasting method is no substitute for sound business judgment. The method can only make sound judgment easier.

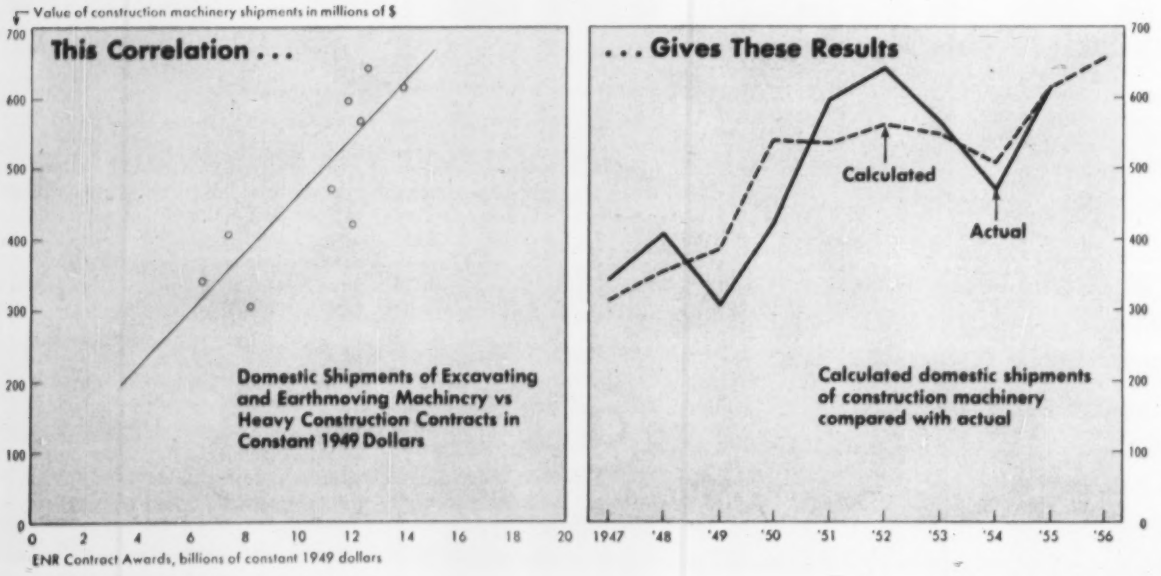


• Machinery shipments forecasting

Another application of the correlation forecasting method is in predicting demand for construction machinery in terms of manufacturers' shipments. The trend in domestic shipments of excavating and earthmoving equipment follows closely the trend in contract awards. The correlation between these two is closest when current dollars are used to measure shipments and constant dollars (deflated to remove shifts in construction costs) are used for construction contracts.

Because of this correlation, the volume of domestic shipments of equipment can be forecast from the prediction of contract awards. This has been done for the first time by Construction Methods and Equipment (McGraw-Hill) in forecasting its new Index of Domestic Shipments of Excavating and Earthmoving Machinery (see chart above).

The scatter diagram (below left) shows the relationship between contract awards valued in constant 1949 dollars and current dollar value of



construction machinery shipments in the same year. The "regression line" drawn among these points describes the correlation relationship.

On the basis of ENR's latest forecast of 1956 contract awards at $21.4 billion, (July 12, 1956), which has been deflated to 1949 dollars, CM&E's index of domestic shipments is predicted to hit a new high of 245 this year.

This forecast is actually higher than the contract volume prediction indicates. The reason for upping the estimate is that shipments this year will reflect in part last year's very large backlogs of new equipment orders which resulted in slow deliveries for many types of machinery. Thus, part of the booming demand for new equipment in 1955 is expected to show up in shipments this year. This will be piled on top of shipments resulting from the continuing sharp rise in sales.

In addition, there is evidence of contractors buying further ahead in anticipation of continued slow deliveries now that the new highway program is set in motion with $33 billion in federal aid funds. Contractors who are counting on this upsurge in highway business are lining up equipment so they'll have it when they need it.

Morrison-Knudsen, for example, bought heavily and in advance of needs last year when it purchased $11.15 million in new construction equipment. This was more than double the $5-million per year average rate of buying during the 1950-54 period. M-K cited the problem in getting new equipment—"delivery periods quite commonly running six to nine months." Moreover, as of a few months ago, it expected the situation to become increasingly acute.

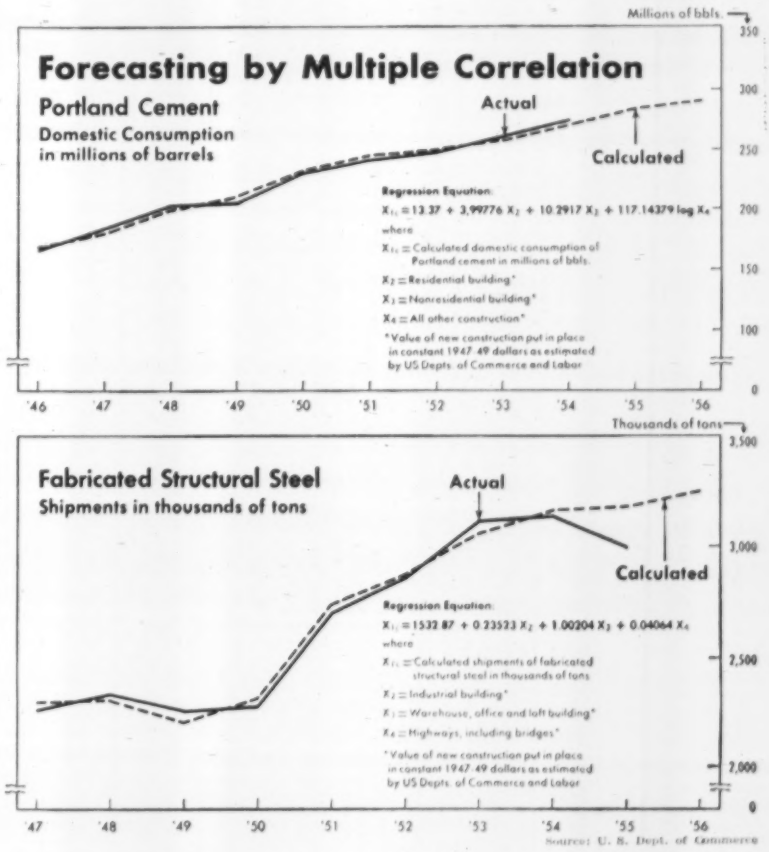
This points up the need for applying reasoned judgment to forecasting, whether it be sales of construction equipment, future design work, new contracts or what. The chart at bottom of facing page shows how "forecasts" of construction equipment shipments from contract awards, based on the regression equation, compare with actual shipments during 1947-55, assuming that the contract-award forecast was "on the nose" each year.

In 1955, the "forecast" was on the nose and it was very close in '53 and '54. Wider differences appear in previous years for logical reasons. In the early postwar years, contractors were building up their yards of equipment because during the war they were unable to get new machines. That's why actual shipments were higher than the "forecast" of "regression" values. But in 1949's general business recession, purchases dropped even though contracts showed a modest rise during the year. Lack of confidence in the near future at a time when their postwar rebuilding of stocks was nearing completion caused contractors to hold off on new orders. A sharp slump in sales followed.

Then, in the second half of 1950 came the Korean defense industrial expansion, superimposed on the biggest homebuilding year in history. Equipment shipments rebounded from the 1949 low, rising sharply during 1950 and '51. However, catching up with the rush in orders wasn't accomplished until 1952.

A drop in shipments during 1953 and '54 reflected the decline in contract awards in the second half of '53 and the very poor first quarter of '54. Though contracts reversed their downtrend in the second quarter of '54 and the boom began which is still surging ahead today, equipment sales didn't turn upward until late in '54. Orders piled up in '55 at a rate well above many equipment makers' ability to produce and ship on normal delivery schedules. Because of this, deliveries on new orders began to slow up early in '55. Order backlogs have continued large and deliveries are still slow for some types of equipment, especially larger power shovels and cranes, tractors and rubber-tired scrapers.

Unless changing conditions are taken into account, forecasts risk missing their mark by a good margin.


Forecasting by Multiple Correlation
Portland Cement
Domestic Consumption
in millions of barrels
Millions of bbls.
Actual
Calculated
Regression Equation:
X1 = 13.37 + 3.99776 X2 + 10.2917 X3 + 117.14379 log X4
where
X1 = Calculated domestic consumption of Portland cement in millions of bbls.
X2 = Residential building*
X3 = Nonresidential building*
X4 = All other construction*
* Value of new construction put in place in constant 1947-49 dollars as estimated by US Depts. of Commerce and Labor
350
300
250
200
150
100
0
'46 '47 '48 '49 '50 '51 '52 '53 '54 '55 '56
Fabricated Structural Steel
Shipments in thousands of tons
Thousands of tons
Actual
Calculated
Regression Equation:
X1 = 1532.87 + 0.23523 X2 + 1.00204 X3 + 0.04064 X4
where
X1 = Calculated shipments of fabricated structural steel in thousands of tons
X2 = Industrial building*
X3 = Warehouse, office and loft building*
X4 = Highways, including bridges*
* Value of new construction put in place in constant 1947-49 dollars as estimated by US Depts. of Commerce and Labor
3,500
3,000
2,500
2,000
0
'47 '48 '49 '50 '51 '52 '53 '54 '55 '56
Source: U. S. Dept. of Commerce

• Forecasting by multiple correlation

Multiple correlation is a method of forecasting sales from forecasts of two or more independent influences, based on the relationship between sales and these influences. For instance, sales may be determined largely by a few types of construction rather than by all types of work. A correlation of sales with contract awards for those specific types of work makes it possible to compute a regression equation. This equation will weight the effect of each independent factor in the forecast on the basis of its historical relationship with sales.

Examples of the multiple correlation method applied to estimating shipments of portland cement and fabricated structural steel appear in the charts above. The charts compare shipments calculated from regression equations with actual shipments annually for several years through 1954 or '55. Furthermore, shipments are calculated for the years

1955 and 1956 from forecasts of the independent influences—in this case the value of new construction put in place estimated by the Departments of Commerce and Labor.

Both correlations are by Nathan H. Schein, of the Building Materials and Construction Division, BDSA, U. S. Dept. of Commerce. The multiple correlation for fabricated structural steel shipments was published in the Commerce-Labor bulletin Construction Review, December '55, while the portland cement correlation appeared in the February '56 issue.

The calculations in multiple correlation are more involved than for simple correlation, so it's wise to limit the number of independent factors affecting sales to those which have the greatest influence. Also, the larger the number of independent factors used for correlation analysis, the greater the probable error in estimates from the regression equation.

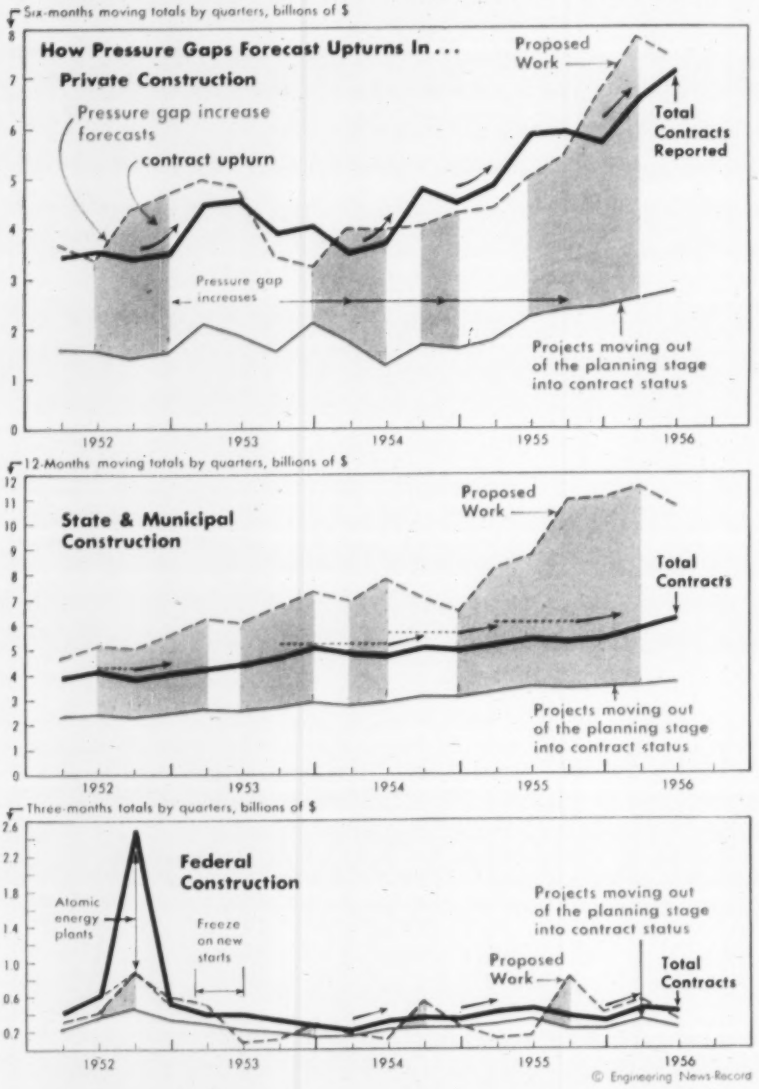
Domestic shipments of portland cement reported by the U. S. Bureau of Mines, plus net imports, were correlated annually 1946-54 with the value in constant 1947-49 dollars of three broad types of new construction put in place (estimated by the Depts. of Commerce and Labor): residential building; nonresidential building; and all other new construction. These three types of construction were treated as separate influences on cement shipments, rather than using the whole construction total, because each of these types shows a different degree of relationship to total shipments. In fact, the relationship between value of "all other construction" put in place to total cement shipments is non-linear, while the other two types of work have a linear relationship. For this reason, the logarithmic value of "all other construction" is used in computing the linear regression equation.

Similarly, the multiple correlation of fabricated structural steel shipments is based on actual shipments reported by AISC annually 1947-54 and Commerce-Labor estimates of work put in place in constant 1947-49 dollars. However, put-in-place figures were limited to these types of construction: industrial buildings; warehouses, offices and loft buildings; and highways, including bridges. Other types of construction were excluded because of low correlation with shipments.

In each of these examples, the regression equation for making estimates of future shipments is based on historical data and thus past relationships. Because these relationships between volume of construction and materials use may shift with design trends, regression equations should be updated regularly.

Pressure Gaps Forecast Turning Points in the Contract Award Trend—

When the ratio of projects entering the planning stage to projects moving from design to construction contract increases, "pressure is up" for an increase in contract awards


Six-months moving totals by quarters, billions of $
How Pressure Gaps Forecast Upturns In . . .
Private Construction
Pressure gap increase forecasts
contract upturn
Pressure gap increases
Proposed Work
Total Contracts Reported
Projects moving out of the planning stage into contract status
1952
1953
1954
1955
1956
12-Months moving totals by quarters, billions of $
State & Municipal Construction
Proposed Work
Total Contracts
Projects moving out of the planning stage into contract status
Three-months totals by quarters, billions of $
Federal Construction
Atomic energy plants
Freeze on new starts
Projects moving out of the planning stage into contract status
Proposed Work
Total Contracts
© Engineering News-Record

The Pressure Gap Method

. . . for forecasting construction control awards

The need by construction management for forecasts of heavy construction contract awards is becoming increasingly critical. ENR has published annual forecasts regularly for several years, with reasonably good results. To make its forecasts, ENR relies heavily on its own unique reports of proposed heavy construction. The ENR Backlog of Proposed Construction is a continuous monthly inventory of identified projects currently in the planning stage. Each month, new projects are added to the backlog while others move out to construction contract. Some others are pulled out of the backlog when systematic checks show that they have died on the vine during some stage of planning.

Thus, the backlog is a vast reservoir of future contract awards—the only such measure of demonstrated award

potential in existence. It now totals a record $100 billion, about five times the current annual rate of contract awards.

Because the time a project takes to clear the design stage and go to construction contract varies widely, the total standing backlog is still too rough a tool for direct use in forecasting awards in a given period. (A future refinement such as an age distribution of projects would make it much more useful.) However, a very useful tool exists in the relationship of new proposed work entering the backlog to work moving out to contract awards.

ENR has developed the "pressure gap" method of forecasting turning points in the contract award trend three to nine months ahead of time. Spotting the turning points is vital in predicting contract volume because heavy construction awards can fluctuate widely from year to year.

The "pressure gap" is the spread between the volume of new work being proposed and the volume of other projects which move out of the backlog into contract status. **When the pressure gap is increasing, an increase in construction contract awards will follow, and vice versa.** The three charts on facing page show how pressure gap changes that develop in private work, state and local public works and federal construction, lead to significant shifts in the contract award trend.

The lag between the time a pressure gap begins to increase and the time construction contracts increase varies for these three categories of ownership. It is related to the time it takes for projects to move through the planning stage to construction contract. For private work, the time lag from pressure gap increase to a rise in awards ranges from three to six months, but is most often three months. Duration of upswings in '52, '53, and '54, ranged from six to nine months, before downturn.

These time lags between pressure gap and upturn and the durations of upturns are logical because better than half of the private projects moving out of the planning stage to construction contract status spend six months or less in the planning stage (based on analysis of ENR project reports). Moreover, three out of four private projects have spent 12 months or less in planning before the construction contract is awarded.

State and municipal public works take longer to pass through the planning and design process. Here, the pressure gap increase precedes the upturn in awards by 9 to 12 months. The chart which shows this relationship uses a 12-month moving average for state and local projects to remove

(Continued on page 36)

SERVICE-SCORE STICKERS provide valuable wire rope facts

...to test performance, speed reordering

For efficient wire rope operation you must have wire rope facts—brief, handy, accurate facts. You need them for safety (when did that line go on?). You need them for reordering (what size is the hoist line?). And you need them most of all for figuring cost (how long did it last?).

But gathering wire rope facts can be time-consuming—unless you have an easy, simple system.

Leschen's Service-Score Stickers provide such a system. The facts are always at hand—on the machine while the wire rope is working, and in the record book from then on.

Service-Score Stickers make it easy to compare the service you get from various rope constructions, types, and brands, so you *know which one is best* for you.

With the Service-Score System you prove to yourself that Red-Strand wire rope consistently exceeds industry standards for strength and safety.

Write for your starting supply of Service-Score Stickers now —or see your Leschen distributor.

LESCHEN Red-Strand WIRE ROPE

A DIVISION OF H. K. PORTER COMPANY, INC. HKP

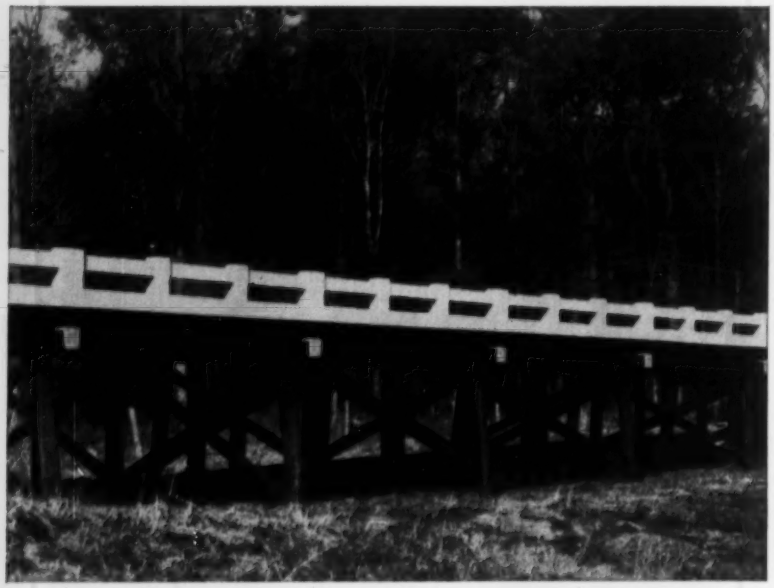
Keep the score and you'll use it more Red-Strand Wire Rope

LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri

Consider these advantages of

PRESSURE-CREOSOTED WOOD

as a permanent construction material



Low cost . . . to build and maintain. This Alabama bridge of pressure-creosoted wood has given excellent service since 1951 and has required a minimum of maintenance. There are thousands of similar bridges throughout U.S.A., carrying heavy loads day after day.

- ☐ Water resistant
- ☐ Lightweight but strong
- ☐ Low in initial cost
- ☐ Easily worked with simple tools
- ☐ Never a rust, rot or spalling problem
- ☐ Never needs painting

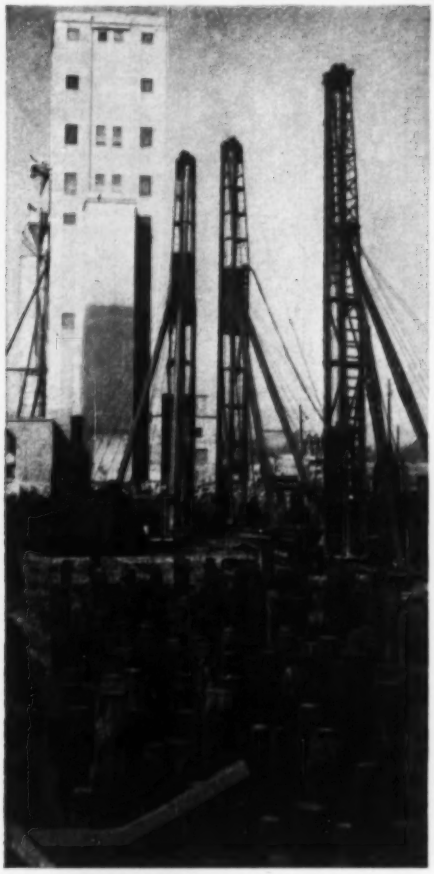
WOOD is one of the most versatile of construction materials. When it is pressure-creosoted to eliminate rot, insect and borer damage, it becomes a permanent construction material suitable for some of the toughest construction jobs.

If you have overlooked wood—or underestimated it—as one of your primary materials of construction, consider some of the uses pictured on this and the next page.

Wood sign posts never need maintenance painting when pressure-creosoted. Park signs like this one in Wyandotte County Park, Kansas, utilized sections of pressure-creosoted piles or poles. Such signs are not only attractive and easy to install, but also cost less than signs made with other commonly used materials.

Easily assembled. Neither expensive forms nor expensive skilled labor is required to make pressure-creosoted cribs like these, installed on the McKensie Pass Highway near Eugene, Oregon. Pressure-creosoted cribbing doesn't spall, can be used again if the road is relocated and costs less than other types of cribbing.

As strong as steel. Pound for pound, pressure-creosoted wood guard rail posts have greater impact resistance than steel posts! They cost less than other posts commonly used and never need painting. These pressure-treated posts were installed on a highway in Oregon State to support galvanized cables and fittings.



Good for 50 years or more. A total of 4,744 pressure-creosoted timber piles was used to support a 3-million-bushel addition to this grain elevator in Kansas City. At less cost in place than other commonly used piles, pressure-creosoted piles provide excellent protection both above and below ground—with never a rust, rot or spalling problem.

Toughest floor available. Spark-proof, skid-proof, safe and economical floors are provided by pressure-treated wood blocks, cut and laid on grain ends. Over 778,000 sq. ft. of such flooring has been installed in this building—over 3.3 *million* sq. ft. in other plants at Caterpillar Tractor Co., Peoria, Ill., since 1920.

A dollar or less per square foot. Permanent cover at low cost is provided with economical pressure-creosoted pole construction. This Baltimore auction house, for example, withstood Hurricane Hazel's 100 mph winds which ravaged and destroyed other buildings in the vicinity! Treated poles in the ground will last 30 years or more, to give you *permanent* protection against rot and insects.

WHY CREOSOTE IS THE BEST WOOD PRESERVATIVE AVAILABLE

Ideally, a wood preservative should: be toxic • stay in the wood • be impervious to water • penetrate deeply into the wood • be highly adhesive • resist action of chemicals in soil and water • provide a clean, dry finished product.

Research and experience have shown there are a number of good preservatives, each with some of these qualities . . . but only one preservative has *all* of these qualities. It's CREOSOTE.

There are over 160 known chemical compounds in CREOSOTE, all of which are toxic to organisms that are destructive to wood.

CREOSOTE, because of the nature of its chemical components, has high penetrating characteristics.

Because CREOSOTE is impervious to water and highly adhesive, it will not leach or hemorrhage out of the wood.

These characteristics, plus the stability of the compounds in CREOSOTE, also mean that its effectiveness is not neutralized by contact with acids or alkalis characteristic of certain soils.

CREOSOTE, when applied under carefully controlled pressure treatment, gives you a finished product that is clean, dry and easy to handle. It becomes a permanent construction material that never needs to be painted or coated; will not rust, rot or spall.

There are over 300 modern wood treatment plants through the United States that stand ready to serve you.

For information on availability of pressure-creosoted wood in your area, write Koppers Company, Inc., Tar Products Division, Pittsburgh 19, Pa.

KOPPERS

TAR PRODUCTS DIVISION
CREOSOTE

the pronounced seasonal swings in contracts and thus show the trend clearly.

On federal work, the lag between rising pressure gap and increasing contract awards was six months in '54, '55 and '56. No upturn materialized in 1953 following the flood of new projects proposed in 1952 because the administration froze new project starts in February '53. This freeze thawed gradually so that no marked upturn in awards became evident in '53.

In addition to spotting turning points in the contract award trend, proposed work is also the key to estimating the volume of contract awards a year ahead. This requires considerable judgment because the total backlog cannot be segregated into target dates for work to be awarded over a specific time interval. Moreover, projects moving out of the backlog made up only about half of the total contract volume—more than half for public works, but less than half in the case of private work. The balance of the contract total represents projects not previously announced as entering the planning stage so they don't enter the backlog in advance of contract.

However, the "pressure gap" method is extended to the flow of new proposed work in each type of construction—waterworks, sewerage, highways, industrial building, etc.—to estimate the individual type award totals. The increasing or decreasing pressure is applied by judgment to the current level of contracts to predict the future level.

After making preliminary estimates this way for each type of work, information on expected contract lettings for unusually big jobs is incorporated in the estimates.

The preliminary forecast figures should be checked out against the indicators of the flow of new capital for construction. These include: municipal bond sales and results of bond elections; corporate security sales for construction; federal construction money appropriated for the fiscal year which carries into next year. These figures are compiled and published in ENR. (The Bond Buyer publishes municipal bond approvals.) In connection with the financing outlook, the expected trend in supply of investment funds should be taken into account. If a glut in municipal bond sales is imminent, this may hold up contracts until financing arrangements can be made more advantageously. Many different sectors of the economy compete for money, and when it's tight, one type of construction market may divert part of another's share—witness what's happened to the mortgage money market so far this year in competition with business demands for money to pay for plant and equipment.

Also, there may be some question of materials production being able to supply the demand indicated by the preliminary forecast. This year, the record volume of construction is straining capacity, order backlogs are high, deliveries of many materials are slow, and the result is shortages, which are expected to delay contracting schedules of some state highway departments, for example, and which have already hindered progress on some jobs already under way.

Finally, a review of prospects for general economic activity to determine the business climate for next year should be used as a check point. However, construction has been leading the economy by the nose in recent years so that the effect of the economy on construction contracts has not been nearly as much of a stimulant as construction contracts have been for the economy.

The Jobs-in-Planning Method

. . . based on needs of individual projects

Short-range forecasting of both market and sales is an integral part of a major structural steel erector's contracting policy. This firm considers its forecasts "essential to intelligent action in its day-to-day sales efforts."

Keystone of its forecasting method is an analysis of planned or proposed construction projects. A careful record is kept by each district office covering all such projects in its territory. Every calendar quarter, the district sends to headquarters a detailed summary of these records indicating the approximate tonnage of new inquiries expected for the next two quarters and next 12 months. Information for each identified job includes: job name; owner; location; estimated weight of steel; and approximate date when bids will be called.

Headquarters compiles regional totals, classified as to type of work (industrial buildings, highways, bridges, etc.), and compares them with totals from previous periods and earlier forecasts. Adjustments are made to allow for unidentified work and incomplete coverage. At this stage, careful application of judgment is necessary to allow for over-optimism or pessimism, trends in contracting activity, known public works budgets, and general business forecasts for the period in question. For assistance at this stage, it relies generally on the following factors:

1. Annual forecasts of general business activity and economic indicators prepared by its economics unit and periodically updated.

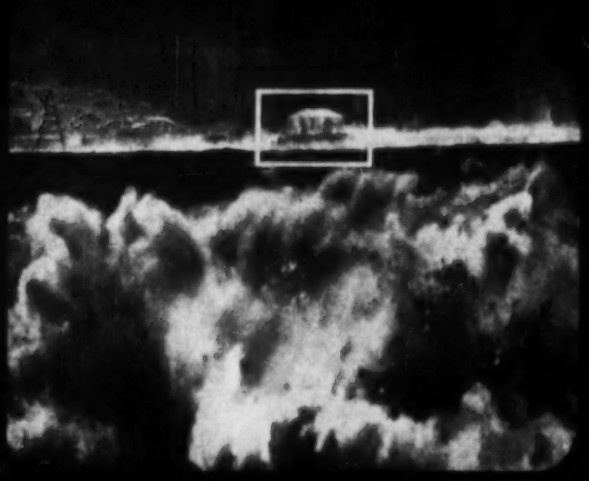
2. Trend of major construction contract awards as reported by Engineering News-Record, and trend of the ENR heavy construction backlog. State-by-state records by type of work are a big help here.

3. Current surveys of capital expenditures—both statistical and announced programs by major firms and industries. The company also follows carefully such informed opinion as the Business and Finance Section in ENR, and various other money-market commentary.

4. Recognized construction activity forecasts are also considered, such as the Engineering News-Record and

When VIBRATION is the problem . . .

PROLONGED CONFINEMENT COUNTS



Greenhouse placed only 48 ft. from blast proves Atlas methods of bottom initiation produce negligible vibration. Not a single pane of glass cracked.

Extreme control was required in this blast—only 25 ft. from houses. Atlas millisecond delay pattern caused less vibration than a slammed door!

Workers in nearby factories scarcely noticed this carefully confined blast. Noise, vibration and throw were controlled, the Atlas way.

Atlas explosives and Atlas methods . . . the right cost-cutting combination

The right combination of Atlas explosives and techniques results in *prolonged confinement* of explosive force. No geysers of escaping gas . . . no wild flying rock. You get excellent breakage, ready for the shovel. Public relations problems are simplified, because noise and vibration are minimized.

Plan your next blast with your Atlas representative. And write for "Better Blasting." It's filled with information on new methods and materials.

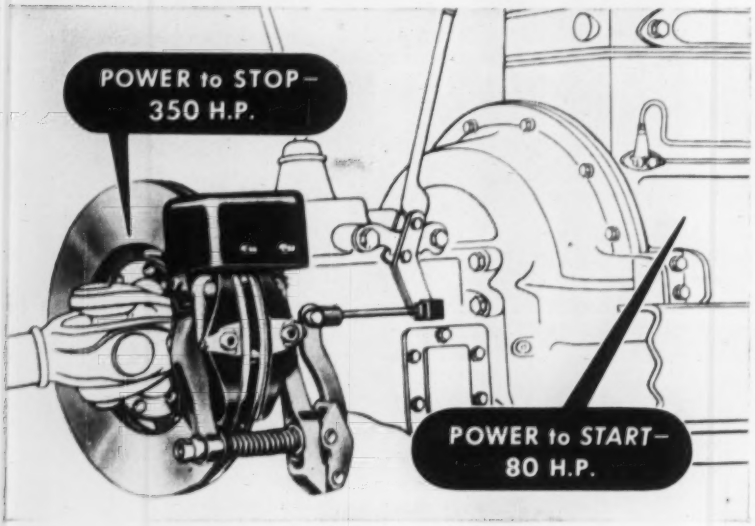
EXPLOSIVES DEPARTMENT
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
offices in principal cities

an ACCO product

It pays to specify

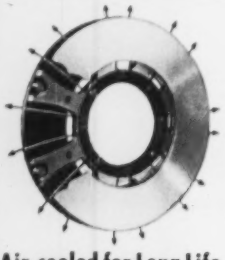
Tru-Stop Brakes

FOR LONG LIFE—EASY SERVICE



Have the surplus braking power emergency service requires

• In terms of horsepower, brakes actually do more work than the engine. For example:



Air-cooled for Long Life

• The terrific heat generated in braking shortens lining life. TRU-STOP design quickly dissipates this heat. Most of the disc is exposed to the air even during braking. And a jet of cooling air circulates between the disc blades and carries off heat.

Where it takes 80 H.P. to accelerate to 20 miles per hour, 350 H.P. is required to make a safe stop at that speed within required limits.

TRU-STOP Emergency Brakes have the surplus braking power required for emergency service. That is why they are more adequate for use as parking brakes.

TRU-STOP Brakes lower service costs, too. Relining or adjustment is a simple job for any mechanic with ordinary tools. It is not necessary to drop the drive shaft.

Specify TRU-STOPS for factory installation on the next vehicle you buy. Send for your copy of this booklet —the complete story of TRU-STOP Brakes.

ACCO

TRADE MARK

Automotive and Aircraft Division
AMERICAN CHAIN & CABLE

601 Stephenson Bldg., Detroit 2
2216 South Garfield Ave., Los Angeles 22 • Bridgeport 2, Conn.

the F. W. Dodge contract awards, among others.

Based on this information, prospective inquiries are forecast quarterly. This forecast is checked continually against actual results as the quarter progresses, using cumulative weekly average of tonnage.

Reasonably accurate forecasts of the total market level and trend are a further step. The known relationship between the firm's inquiries and bids, and the total market for fabricated structural steel as reported by AISC bookings is applied to the quarterly forecast of prospective inquiries.

In addition, and in a similar manner, the firm follows bid price trends by compiling data from district offices on the tonnage awarded to others.

The company reports good overall results from this system and it is able to evaluate sales performance continuously. This, along with a careful appraisal of its shop schedules and available mill material, enables it to plan contracting strategy for the best long-run results.

The Largest Above-Ground Water Reservoir in Service

The world's largest above-ground water reservoir — holding 10,100,000 gallons—has gone into service at Spokane, Wash. Total cost of the big reservoir was just under $300,000—less than $30,000 per mg.

The steel tank, built by the Chicago Bridge & Iron Co., serves about one-third of Spokane's northside homes.

The record reservoir is served by two domestic water pumping stations. Both lift water from an "underground river" — an apparently inexhaustible natural reservoir in sand and gravel underground, believed fed by seepage from Lake Pend Oreille in northern Idaho and by natural mountain runoff.

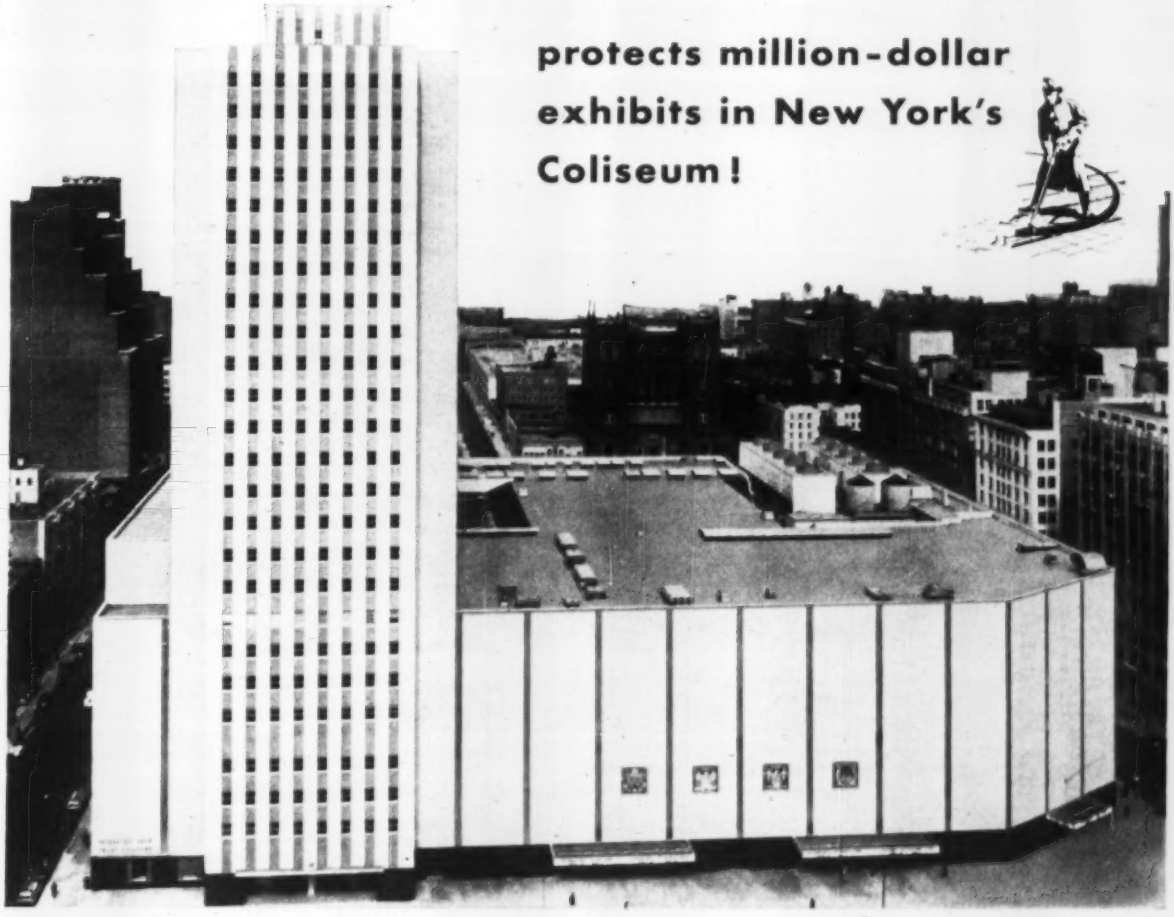
Telemeter control is used on the flow of water through a 30-in. pipe that enters the bottom of the reservoir. A phone wire transmits the tank level to a pressure recording device which, in turn, activates pumps at the pumping plants to maintain the proper tank level at the reservoir.

The 10-mg reservoir, with its 1¼-in steel plate, posed some problems during construction. Temperature was one. During normal operation the water temperature will vary less than 3 deg from 48 F year around. But during construction, temperature variations caused considerable expansion and contraction of the steel walls.

Between a concrete ring wall and the reservoir steel, 6x6-in. skid plates, 3 ft on centers, had to be installed to keep the expanding steel from popping out the concrete.

"FIREFIGHTER" ROOF DECK

protects million-dollar exhibits in New York's Coliseum!



The New York Coliseum, Columbus Circle, New York, N. Y. *Owner*: Triborough Bridge and Tunnel Authority; *Architects*: Leon & Lionel Levy, New York, N. Y.; *General Contractors*: Walsh-Fuller-Slattery, New York, N. Y.; *Roof Deck Contractor*: Keystone Fireproofing Corporation, New York, N.Y.

NEW YORK'S newest landmark, the $35,000,000 Coliseum, protects its expositions by *protecting itself!* 70,000 square feet of Gold Bond "Firefighter" Gypsum Roof Deck add an incombustible fire shield that won't warp or transmit high temperatures when exposed to heat or flame.

The "Firefighter" Roof Deck on the Coliseum was poured-in-place, six stories up. Construction was fast . . . *as much as 30,000 square feet of gypsum can be poured in a single day.* An approved contractor, like Keystone Fireproofing Corporation, can install "Firefighter" Roof Decks on pitched, barreled or flat roofs. Quick setting action allows deck to take full load capacity in less than an hour . . . workmen can walk on poured-in-place gypsum roof deck within fifteen minutes after pouring.

Gold Bond "Firefighter" Gypsum Roof Decks can add valuable properties to your building designs. Send in the coupon below for complete data. National Gypsum Company, Buffalo 2, New York.

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Gold Bond BUILDING PRODUCTS

NATIONAL GYPSUM COMPANY

NATIONAL GYPSUM COMPANY, Dept. EN-86
Gentlemen: Send me Technical Bulletin No. 5[illegible] with complete details on "Firefighter" Roof Decks.

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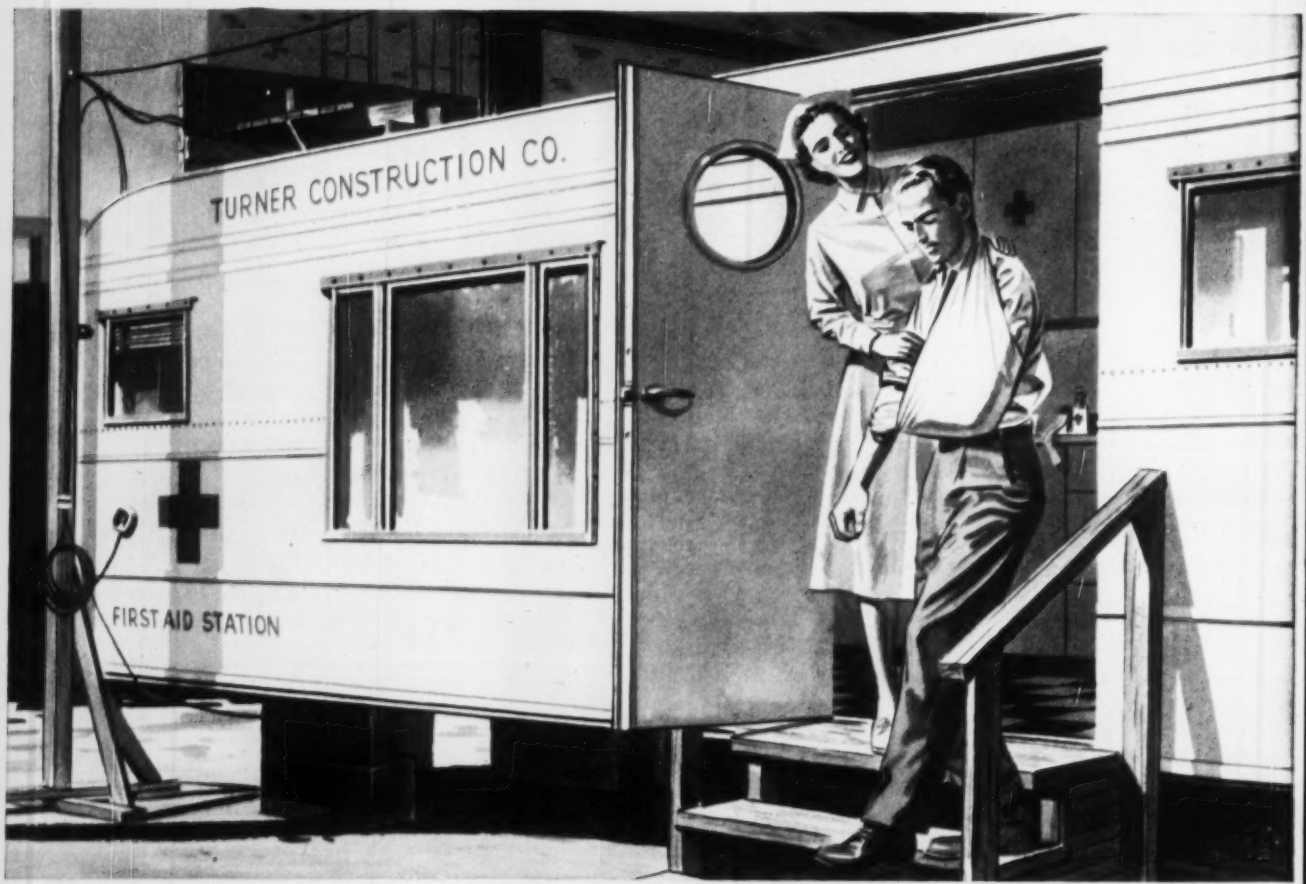
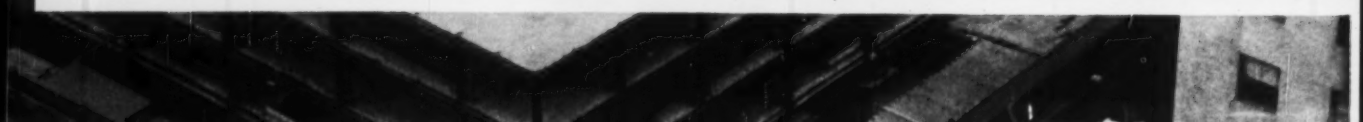




as skyscraper goes up

The story of Liberty Mutual and the Socony-Mobil building

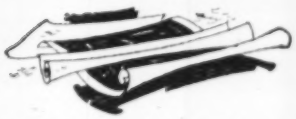
Building a 45-story skyscraper in Mid-Manhattan was a tough, dangerous assignment — yet the safety record on the Socony-Mobil Building was far better than all calculations. Here's why:

General Contractor Turner Construction Company and all sub-contractors were insured by one company — Liberty Mutual. This made it possible for Liberty and Turner to draw up an over-all safety plan — chart the hazards and devise ways to sidestep them — before the job began.

Liberty Mutual provided full-time, on-the-job claims and engineering supervision. Regular safety meetings were held. Every activity was checked. All injuries received immediate attention. Structural surveys and pre-blasting checks were provided by Liberty Engineers. Wherever a man turned, there was a common-sense slogan reminding him to work safely.

Thanks to complete cooperation from management and workers — Liberty's integrated safety program paid off in a noteworthy loss record — insurance savings all along the line.

10 WAYS LIBERTY MUTUAL CUTS INSURANCE COSTS ON CONSTRUCTION JOBS



1. ADVANCE ANALYSIS, by Liberty engineers, spots and controls potential hazards before each of your projects begins.

2. ENGINEERS ON THE JOB who keep your men safe, control damages due to blasting, unsafe operating methods, etc.

3. RESEARCH by specialists in Liberty's own laboratory helps solve your difficult problems.

4. AROUND-THE-CLOCK CLAIMS SERVICE — full-time claimsmen on the bigger jobs — assures fast, fair claims handling.

5. ABILITY TO FOLLOW YOUR OPERATIONS — Liberty has branch offices in 146 cities — at your service.

6. SERVICE PERSONNEL live on large projects both here and abroad, plan and guide safety operation.

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9. YOU DEAL DIRECT with company sales, loss prevention, claims and medical personnel. No middlemen.

10. INSURANCE AT LOW COST. Liberty's "expense ratio" on Compensation is lower than any other mutual company. Liberty has returned $363,275,898 in dividend savings to policyholders.

For 20 straight years — the nation's largest writer of Workmen's Compensation Insurance

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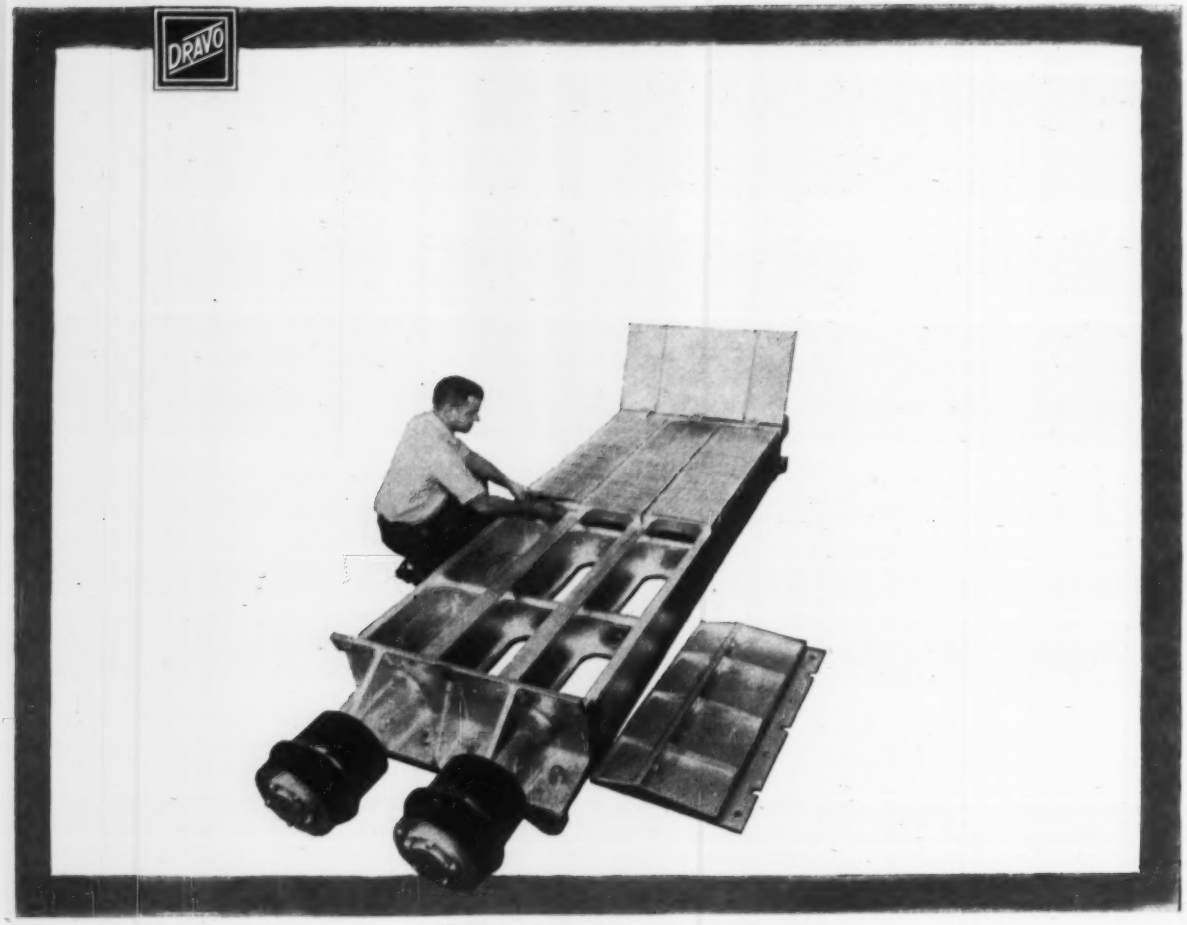

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sintering experience . . . ready to work for you

More than 250 sintering plant installations qualify Lurgi as Europe's oldest and foremost designer of equipment for the treatment of low grade ore. In fact, the total capacity of Lurgi sintering machines now processing iron ore alone is in excess of 30 million tons annually.

An exclusive license agreement enables Dravo to adapt these advanced designs to the needs of American industry.

In a major installation recently completed by Dravo, 124 pallets, like the one shown above, are used. Design features of these pallets are the result of Lurgi's 30 years' experience in sintering machinery construction.

Engineering and planning assistance is available to help you develop equipment or complete plants for sintering, pelletizing or other related ore processing and preparation. Write to Dravo Corporation, Dept. S-100, Pittsburgh 22, Pa.

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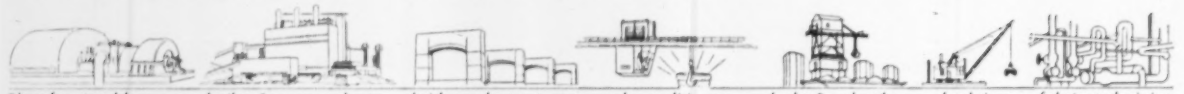
CORPORATION



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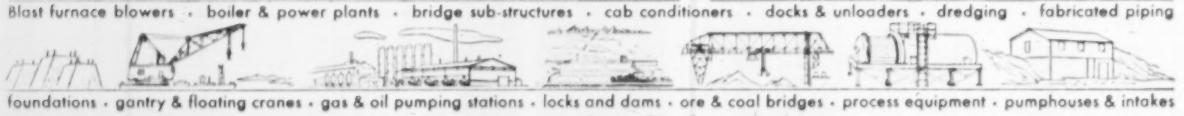

foundations • gantry & floating cranes • gas & oil pumping stations • locks and dams • ore & coal bridges • process equipment • pumphouses & intakes

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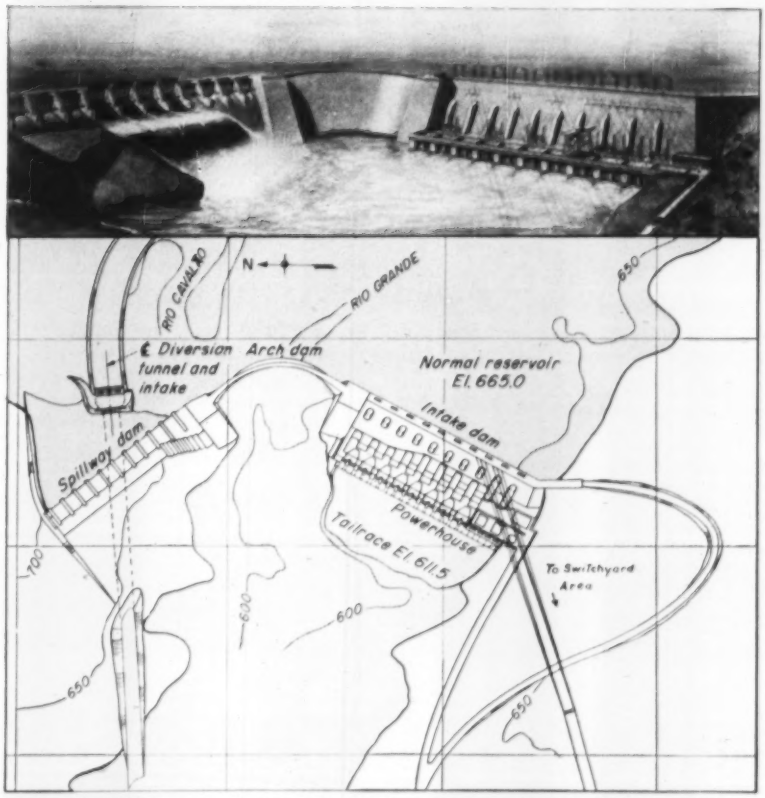
Deep rock and fast water forced redesign of Brazil's Peixoto Dam to . . .

An Arch Between Gravity Sections



FINAL LAYOUT evolved after rock depths were determined by horizontal drilling from shafts. Gravity spillway, 525 ft long, was moved to higher ledge while 615-ft center section became an arch. Intake section is 585 ft long.

In a remote gorge on Brazil's Rio Grande, 288 miles northwest of Rio de Janeiro, Peixoto Dam is being pushed toward completion and ultimate installation of 400,000 kw. It is a significant hydroelectric project as the first in a 5-year, 2,000,000-kw program backed by Brazil's President Kubitschek. It is a significant dam—structurally—in that an arch section is being built between two gravity concrete abutments.

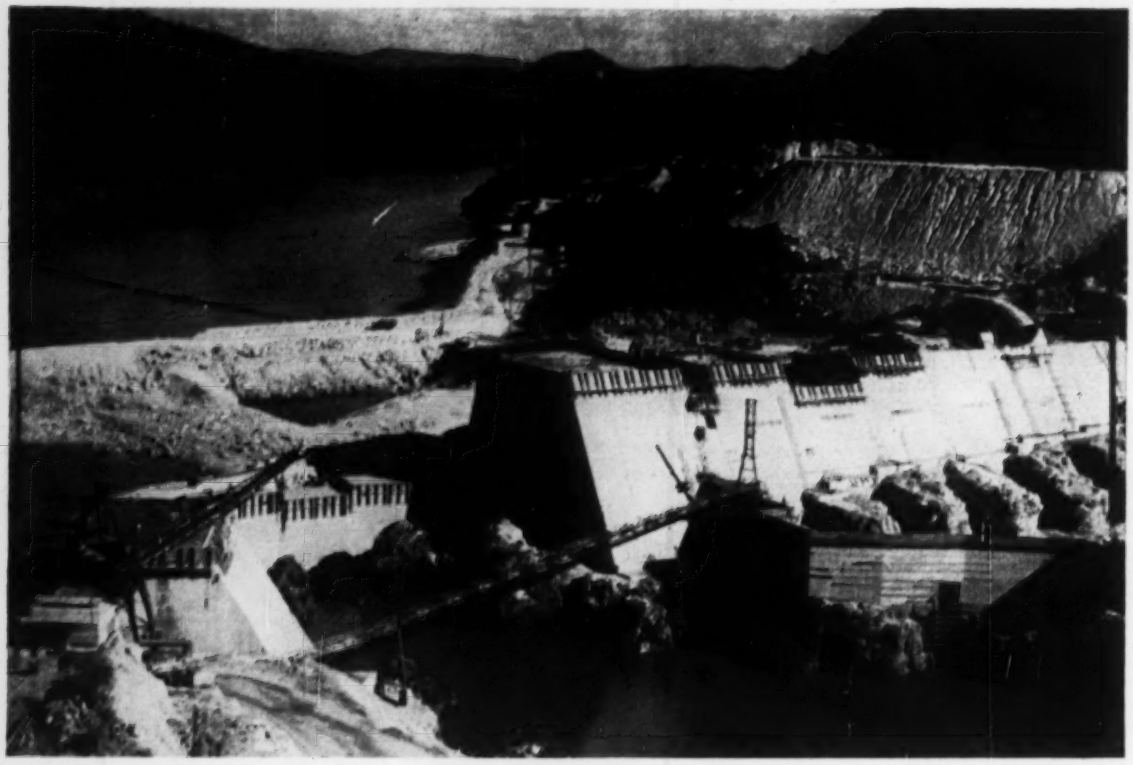
Peixoto (pronounced pishoto) consists of a gravity intake dam 585 ft long on the left bank, a gravity spillway section 525 ft long on the right bank, and a 615-ft arch between, with its thrust blocks abutting the gravity dam sections.

The arch will be 220 ft high, and is being built with a radius of base circle of 255 ft; the central angle is 105 deg at top ring.

Originally, this dam was planned to have a gravity-type curved spillway across the deep portion of the channel. But the rock bottom beneath the fast water was found deeper than anticipated (by drilling horizontally from shafts on either side). The gravity section was ruled out for this part of the dam; it was redesigned as an arch, curving upstream to reach a high ledge of rock for shallower footing. The spillway, too, was moved to higher ledge, final layout of the dam evolving as shown in the drawing.

During the 1955 dry-weather sea-

. . . 53-ft-dia diversion tunnel



CONCRETE PLACEMENT in the arch section was a successful race to complete sufficient low blocks before flood flows topped the cofferdam. Gantry crane was employed at the arch while 15-ton cableway and crawler cranes worked on adjacent sections.

son (roughly April through November) it was possible to place sufficient concrete in the arch section to let it be overtopped safely by flood flows during the winter.

Alternate low blocks of the arch dam were overtopped last December 9, and thereafter raging floods flowed over the dam's center portion while work continued uninterrupted on the higher intake and spillway portions at either side.

• 53-ft-dia tunnel—This anticipated flood flow over the uncompleted dam was in addition to 45,000 cfs flowing through a 600-ft diversion tunnel—one of the largest tunnels ever mined. This 53-ft-dia bore through the solid rock (hard quartzite) of the right abutment discharges into a 300-ft channel leading to the river below the downstream cofferdam.

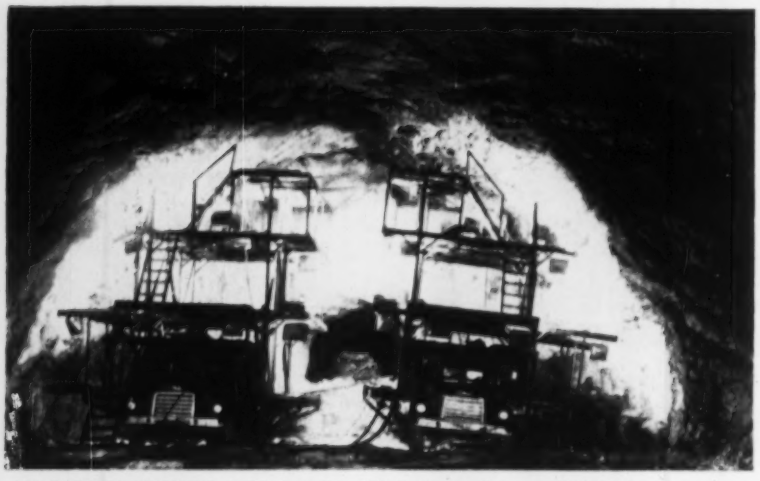
Both upstream and downstream cofferdams (about 1,500 ft apart) are rock- and earth-fill structures which in dry season kept flows up to 45,000 cfs diverted through the tunnel and away from the work. In flood season last winter, both cofferdams were breached, as expected.

Now in its second full construction season, work on all portions of the dam is being pushed while gates are installed on the spillway section and the first two units are installed in the semi-outdoor powerhouse.

A 150-ton-per-hour aggregate plant and concrete plant with three 2-ton mixers are producing what will be a total volume of 500,000 cu yd of concrete in the dam. A 15-ton cableway is placing concrete in the high portions of the work. Crawler cranes work downstream, servicing the powerhouse area.

It is expected that when the rains come again next November or December, the arch dam will be built-up above high water, and the flood flows will pass over the completed spillway. The spillway will have 11 tainter gates, each 40 x 35 ft, and one trash gate, 10 x 10 ft. Its capacity will be 350,000 cfs; maximum flow of record is 240,000 cfs.

The Rio Grande is a stream with potentially several million kw of hydro capacity; it is an undeveloped



DIVERSION TUNNEL is 53 ft in dia, 600 ft long and passes 45,000 cfs.

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WE'RE SORRY...

but we've been caught with our TAMPERS "down"

You may have tried to buy one of our Jay Tampers . . . unparalleled for its quality and performance. For *two reasons* we have been unable to supply dealers with enough units to meet current demand.

FIRST: Due to the nationwide acceptance by State and County Government engineers as well as Contractors both large and small, demand for Jay Tampers the first six months of this year has far outstripped our planned production . . . which we are rectifying.

SECOND: A prolonged strike at the Wisconsin engine plant has retarded *our* production. (And on thousands of units we have in the field, *the Wisconsin engine has proved to us that we can accept no substitute for its quality and stamina.)* But may we suggest that you stop in at your construction equipment dealers — and place your order now. We're sure you'll find the Jay Tamper on your job in the near future.

PRIORITY NOTE: The job you are on may carry a purchasing priority. If your dealer is out of stock, a note to us direct may enable us to reallocate so your dealer can meet your immediate need.

THE JAY Company
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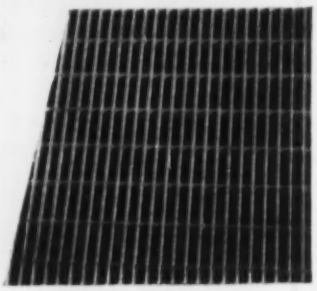
Hendrick Mitco . . .

The Grating With The Deep Cross Bar

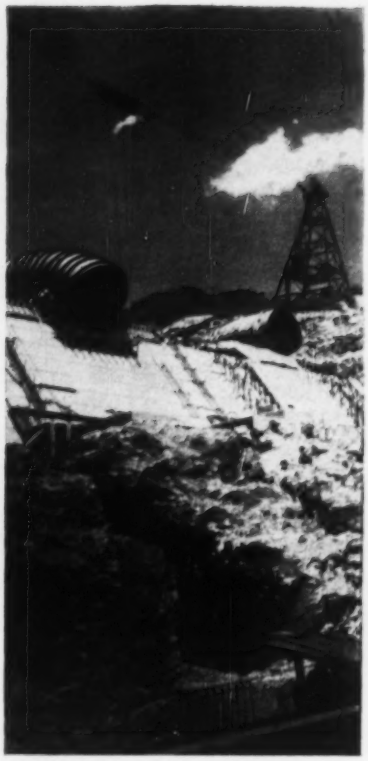
Hendrick's extra heavy Mitco Steel grating can take the heavy beatings of constant industrial usage and keep "on the level"—doesn't warp or bend. Ideal for flooring or walkways, it provides tops in rigidity yet leaves 90% open area for the free passage of light and air.



Heavy-duty Hendrick Mitco is available in eight sizes with bearing bars from 2¼" x ⅜" to 4" x ⅜", and cross bars from 2" x 5/16" to 2¼" x 5/16". Standard Hendrick Mitco is also available in sizes from ¾" x ⅛" to 2¼" x 3/16".

Hendrick MANUFACTURING COMPANY
45 Dundaff Street, Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot and Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Tread • Armogrids • Hydro-Dehazers



TEN PENSTOCKS will feed an eventual 400,000-kw worth of generators at 155-ft head. Turbines are Francis-type rated at 56,000 hp, using 3,500 cfs.

tributary of South America's great Rio Parana, which flows south to the Atlantic at Buenos Aires.

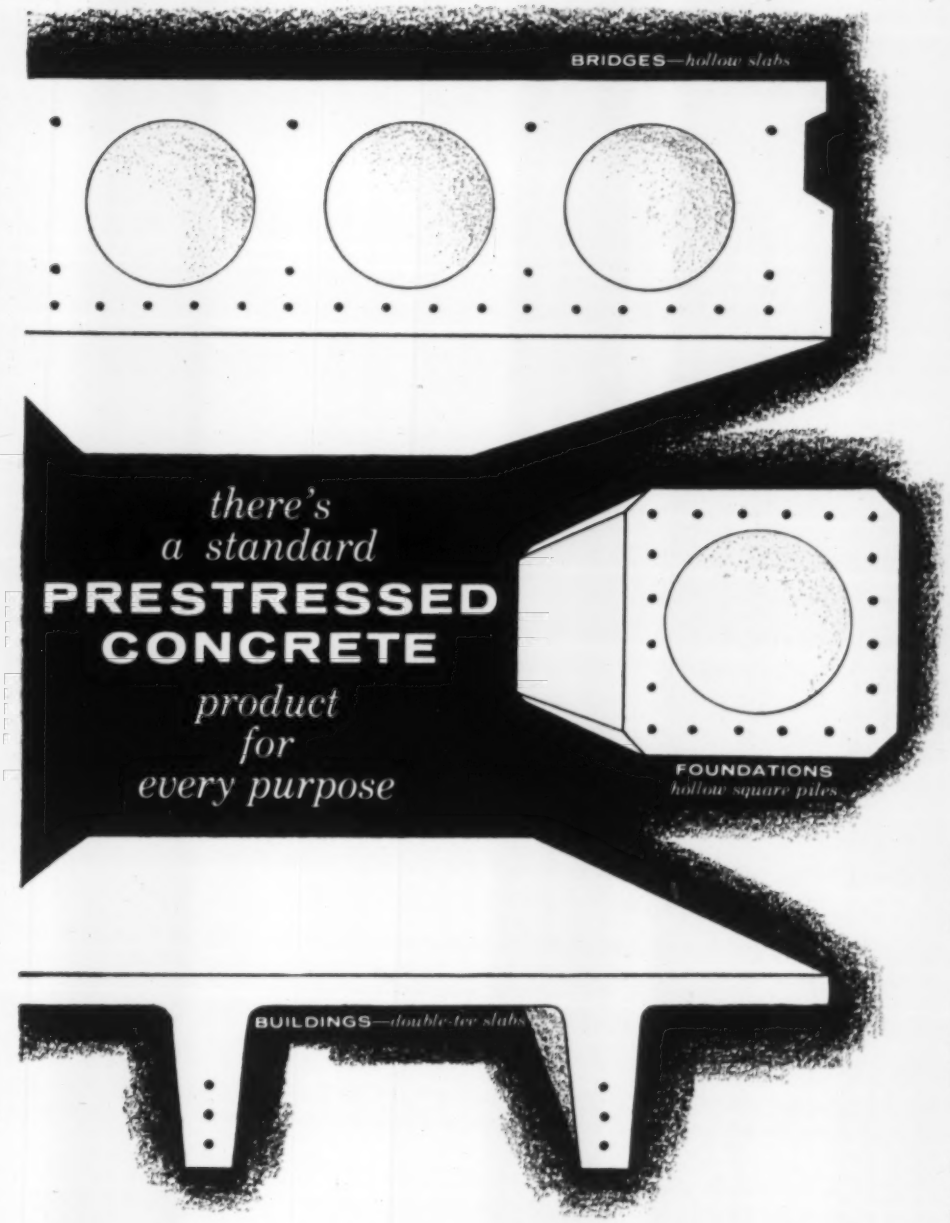
Sites below Peixoto are under study now by the American & Foreign Power Co., through its subsidiary, Compania Paulista de Forca e Luz, which is building and will operate Peixoto.

Peixoto will create a 60-mi lake of 1,600,000-acre-ft capacity with a drawdown of 43 ft. For now, there are to be two 40,000-kw units working at Peixoto at the end of 1956. Eight 40,000-kw units are planned to follow in quick succession. Head is 155 ft at normal pool and tailwater elevations.

Turbine and generator sizes have been dictated partly by the size of components that can be hauled by truck to the site. The last 25 miles is by gravel road.

This project has been designed and is being constructed for Ebasco International (service company for American & Foreign Power) by Ebasco Services, Inc.

R. Olafsen is the project design engineer, and W. D. Lavers is supervising construction. For Ebasco International, J. F. Pett is consulting hydraulic engineer.



A wide variety of standard prestressed concrete products is now available near virtually every job site. There are Double-Tee's, Hollow Slabs, Hollow Square Piles, I-Beams, Joists, or Wide Flange Beams — to name just a few.

These products are manufactured on universal pretensioning beds operated by Freyssinet Affiliates. Besides standard products, the Affiliates also make any type or size of concrete structural unit. Highest standards of design and quality control during production are assured because each Affiliate retains skilled Freyssinet engineers to advise and supervise.

For full information on prestressed products, write, wire or call the Freyssinet Affiliate nearest your job site.

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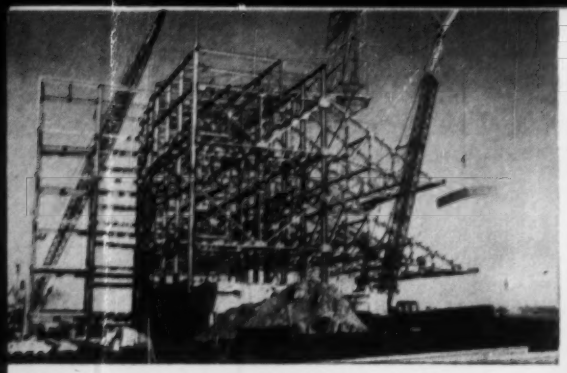


STRUCTURAL STEEL FRAMEWORK under construction, February 27, 1956. Erection of the 1,555 tons of Structural Steel was under the supervision of American Bridge Division of United States Steel.

Cantilever Construction makes every

CLOSE-UP of post-free grandstand showing Structural Steel supporting members for cantilever overhang. Notice large sections of steel decking.

USS STRUCTURAL

with Structural Steel
seat a good seat
in this new Minneapolis stadium

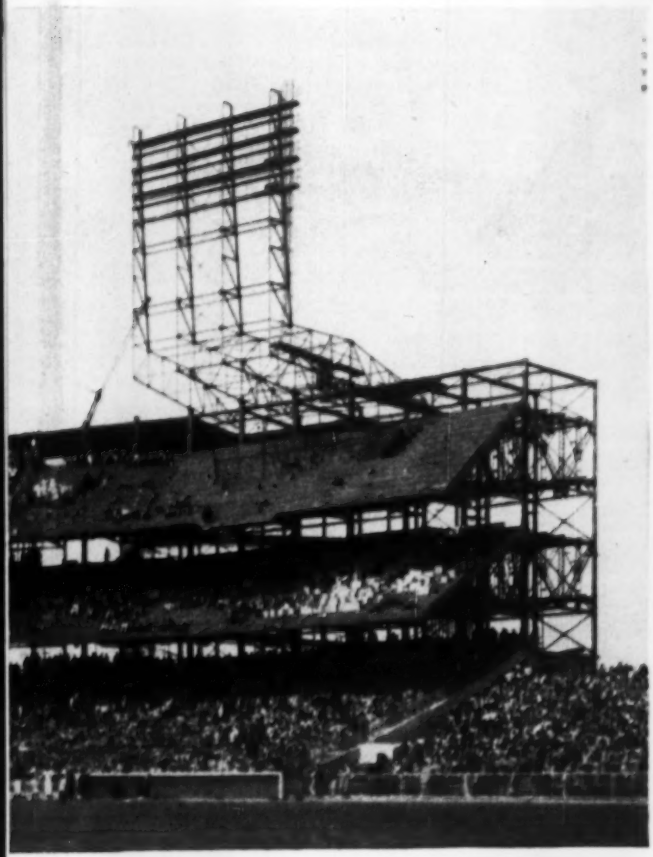
The Metropolitan Sports Area Stadium in Bloomington, Minnesota, just outside Minneapolis, is the fabulous new home of the Minneapolis Millers. Claimed to be the finest baseball stadium in existence, it is actually a Major League size park, although used by a Minor League club. The stadium backers, however, hope that it will house a Major League team in the not-too-distant future.

Remarkably enough, not one dollar of public tax money was used to build this $4,500,000 stadium. It was completely financed through the sale of revenue bonds to more than 2,500 Upper Midwest baseball fans!

Approximately 1,555 tons of Structural Steel were used in the framing of the 30,000-seat stadium. And every seat's a good one, since the cantilevered tiers keep the viewing area entirely post-free. The lower tier is concrete. The upper tiers, roof, exterior ramps, decks, and elevator shafts are of steel. Erection was accomplished with welding and high tensile bolts.

Here is an application which called for a construction material of tremendous load-bearing capacity, great versatility, and honest-to-goodness economy. What other material could possibly have been chosen? Structural Steel is certainly the strongest of load-bearing construction materials, yet the most economical. It can take more abuse than other structural materials, successfully resisting torsion, tension, compression and shear. Enclose it in buildings and it lasts indefinitely—requiring no maintenance. And, of course, it may be welded, bolted, or riveted—erected in any weather. Steel members are fabricated indoors, too, where weather can have no effect on the quality of workmanship. Return the coupon for further information.

OPENING DAY at Metropolitan Sports Area Stadium. *Architect & Engineers:* Thorshov & Cerny, Inc., Minneapolis, Minn., and Toltz, King, Duvall, Anderson & Associates, St. Paul, Minn. *General Contractor:* Johnson, Drake & Piper, Inc., Minneapolis, Minn.



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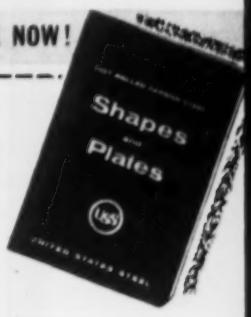

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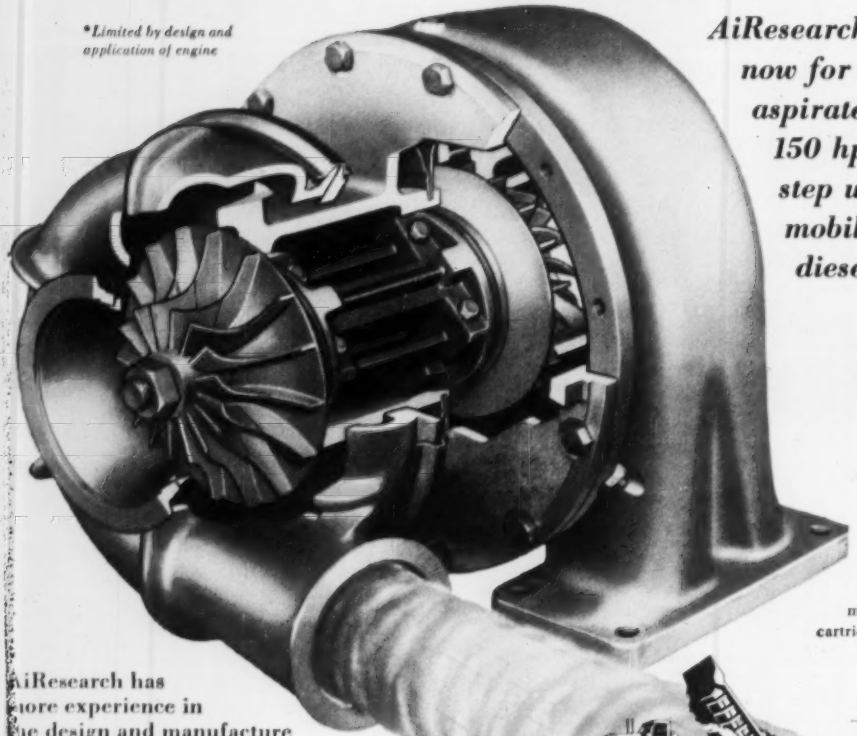
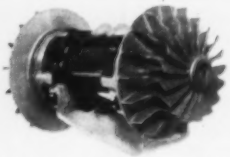
AiResearch Turbochargers improve diesel engine performance up to 100%*

**Limited by design and application of engine*



AiResearch units are available now for use with normally aspirated diesel engines of 150 hp and up. They step up performance of both mobile and stationary diesels, land or marine.

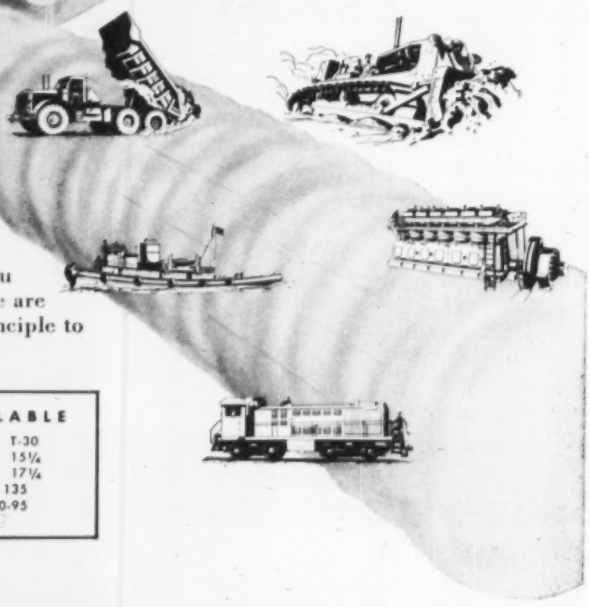


Removable cartridge simplifies repair and overhaul

This cartridge contains the turbocharger's rotating assembly, bearings and seals in a factory balanced package. It can be replaced in minutes with another factory balanced cartridge by a mechanic on the scene.

AiResearch has more experience in the design and manufacture of small turbomachinery than any other company. AiResearch turbochargers are the most efficient and reliable units of their kind. New additions to the AiResearch family of turbochargers have widened their range of application in the diesel engine industry.

Our engineers welcome the opportunity to work with you in improving the performance of your diesel engines. We are happy to confer on applications of the turbocharger principle to your power plants.



AIRESEARCH TURBOCHARGERS NOW AVAILABLE

MODEL	T-10	T-15	T-16	T-30
Diameter — in. nom.	9	15¼	11½	15¼
Length — in.	9	16¾	15¾	17¼
Weight — lb.	39	125	100	135
Output — lb/min. (Standard Conditions)	25-40	35-65	45-65	70-95

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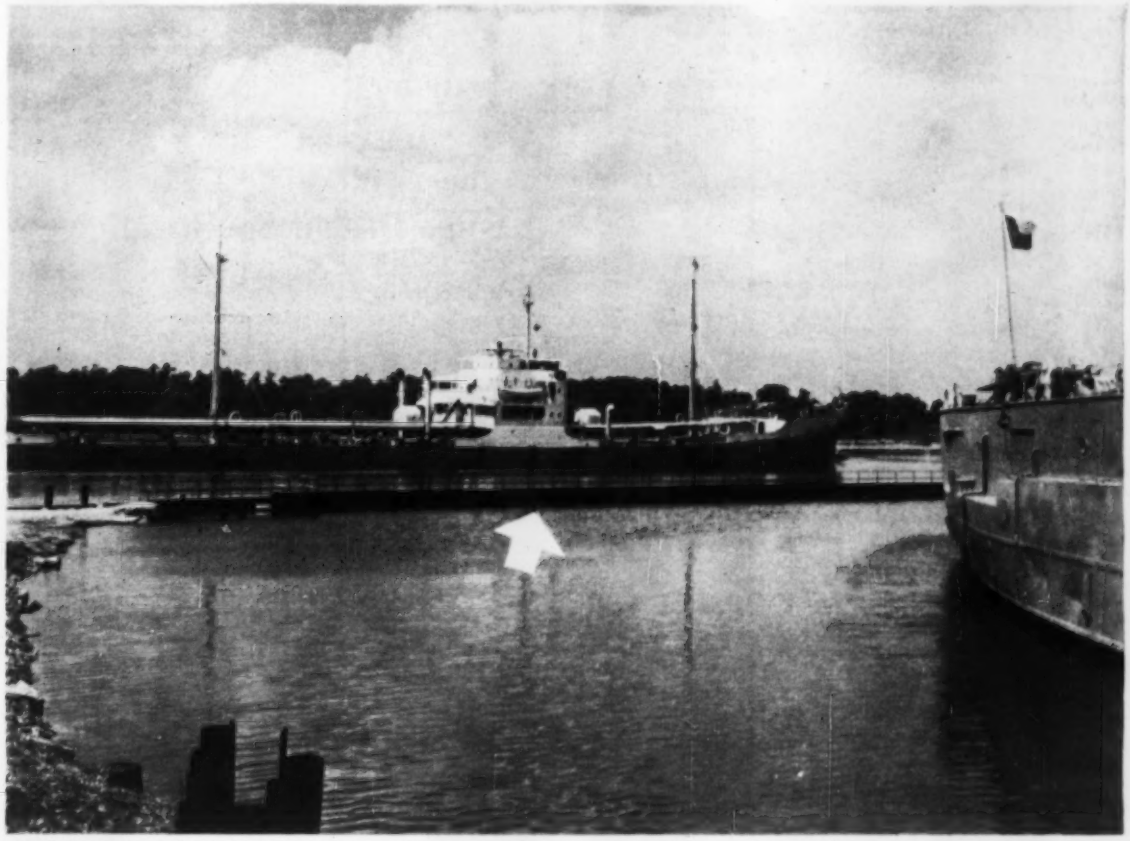
AiResearch Industrial Division

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY



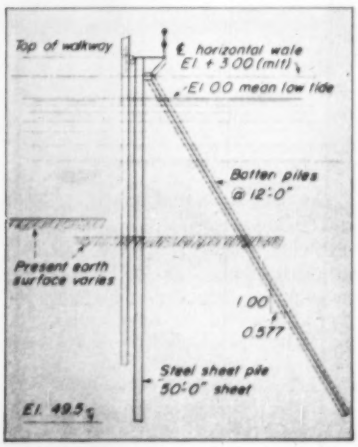
LONE STAR FLAG of the State of Texas flutters at stern of battleship Texas, sitting in permanent "dock" alongside busy Houston Ship Channel. Free-standing bulkhead (arrow) wards off waves from passing ships, providing . . .

A Quiet Bed for a Retired Battleship

In the eight years since the proud battleship Texas came "home" to become a permanent exhibit in the San Jacinto Battleground near Houston, her final resting place has been a cause of some concern to officials of the Battleship Texas Commission.

The open mouth of the slip in which the former U. S. Fleet flagship is berthed has been admitting waves from passing vessels in the Houston Ship Channel, and the friable banks of the slip itself have been eroding slowly but steadily.

To prevent further damage, and loss of area to the Battleground itself, it was necessary to find a quick not-too-expensive and sightly means of stopping the damage. The answer has been found in a $225 per linear foot continuous bulkhead, supported on a series of A-frames to absorb the live loads caused by passing ships, storm- and tide-induced waves, and even occasional mooring loads.



STEEL batter piles support sheeting of bulkhead through wale at top.

• **Ship safe**—The Texas itself is safe enough.

When it was finally berthed (ENR Feb. 10, 1949, p. 20) in the 25 ft of water provided in the slip, a total of 17 ft of mud and clay was pumped around the hull to anchor it firmly. The remaining 8 ft of water were enough to give the battleship the appearance of floating.

But to create the slip, a total of 255 ft of steel bulkhead was removed along the Ship Channel, and not replaced. Over the years, this opening has been enlarged by wave action to 282 ft.

Cost of the protection work was an important matter. The ship is self-sustaining and has been from the day it was opened to the public (attendance now is approaching 2,000,000) and the state has given no fiscal aid to the battleship commission.

• **Final design**—The final design embodies a series of A-frames with a continuous bulkhead face across the slip (along the side of the channel), with a continuous horizontal steel wale secured by bolting and welding to each vertical Z-sheet pile.

The wale itself, in turn, is supported by inclined steel bearing piles at a

30 deg batter with the vertical, these piles placed at 12 ft centers.

Provisions were made for installation later of wood fender piles. Also provided was a walkway and small clearances at either end of the installation and two large openings in the bulkhead itself to permit the same movement of water.

• **Construction**—Construction time allowed to the contractor—Brown & Root, Inc., of Houston—was 60 calendar days.

The contractor used a floating pile driver for all steel handling and driving. The final hammer used was a diesel type, which was quite successful in driving the 50-ft steel sheets into about 25 ft of hard clay, after several air and steam hammers had failed to drive the piles as desired.

The work was done for the Battleship Texas Commission of which Lloyd Gregory is chairman. Engineering design and supervision was under the charge of Cyril S. Adams, Houston consulting engineer.

Ten Groups Join to Draft Standard Analysis Methods

Ten charter-member organizations are mapping expansion plans of a new Joint Committee on Uniformity of Methods of Water Examination. Close cooperation among the principal organizations which prepare, adopt and publish water examination methods is the aim of the committee.

Uniformity of methods and terminology, review of sampling, procedure of determination, and reporting and application of results are among the objectives of the committee.

Members include the Committee on Disposal of Refinery Wastes of the American Petroleum Institute, American Public Health Association, American Society of Mechanical Engineers, American Society for Testing Materials, Association of Official Agricultural Chemists, Federation of Sewage and Industrial Waste Associations, Manufacturing Chemists Association, Technical Association of the Pulp and Paper Industry, the U. S. Public Health Service (Robert A. Taft Sanitary Engineering Center) and the U. S. Geological Survey.

F. W. Gilcreas of APHA will head the new committee in the post of chairman. Others elected to two-year terms are vice-chairman A. Thurn of TAPPI, and secretary C. K. Rice of the ASTM. Membership in the committee is open to any nonprofit group wishing to further the effort toward uniformity of water analysis. Application should be made to the Secretary in care of Refinery Technology Laboratory, P. O. Box 7409, Philadelphia 1.

New York Thruway

Thruway Engineers Modify Some Design Specifications

With more than a year of operating experience now behind them, engineers for the New York Thruway have modified some design specifications to increase efficiency and safety features of the 480-mi road.

Principal changes—to be applied to all new sections now under construction or planned—are these:

- Curves with a radius of up to 7,500 ft will be super-elevated.
- Stabilized shoulders will be made a uniform 11½ ft.
- Median strips will be 104 ft wide, to provide for addition of extra lanes on the inside of the roadway.
- On the Erie Thruway (near Buffalo) only a single restaurant-gasoline-comfort station facility will be installed on one side of the road, with a bridge overpass to permit cars in the opposite lane to reach the facility.
- Fourteen "rest areas"— providing parking areas and minimum facilities only—will be established along the full route.
- Comfort a safety factor—Engineers said that in the design of the "main trunk" of the New York City-Buffalo superhighway, specifications had called for super-elevation of curves up to 5,000 ft radius.

This requirement has proved satisfactory enough as to safety at the design speed of 60 mph., they said, but on a curve of that radius, at design speed, there is a noticeable sway in a conventional automobile as its springs compensate for the turn.

That slight feeling of discomfort has a tendency to make the driver slow down to regain what he feels is a slight loss of control—with added hazard to vehicles behind, travelling at allowable speeds.

The same factor is involved in the widening and standardization of the stabilized shoulders. Original designs called for 11½ ft shoulders on fills, 10 ft shoulders in cuts. Careful checking showed that drivers parking disabled vehicles in the cuts tend to shy away from the embankments in the cuts, thus putting themselves closer to the high-speed traffic lanes. The extra foot and a half is expected to help this situation.

Three rest areas were established along the main trunk last year as an experiment and proved successful enough to warrant the larger program. Officials commented that, with regular service areas roughly 30 miles apart, and parking (excepting in case of accident) forbidden, motorists need some intermediate spot where they may pull out of traffic for a needed short walk, rest, or even to eat a picnic lunch.

- One-side service—The one-side-of-the-road service station to be built on the Erie Thruway is frankly an experiment

Engineers figure that the necessity of building only one set of structures, gasoline and other service facilities and the like, and only one parking area, will offset the cost of an overpass. And it will offer advantages to the concessionnaire in savings in personnel, duplicating equipment—and in the fact that a facility on one side of the road often does more business than the one just opposite.

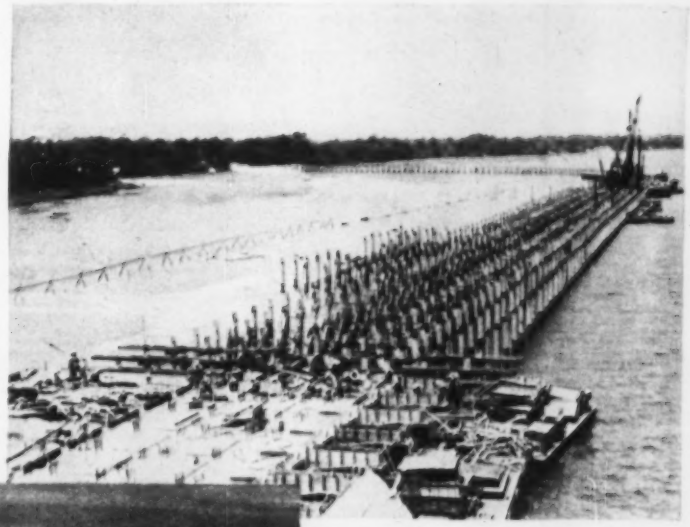
"A restaurant and service station that's just the right distance from where you entered the Thruway for you to stop and refresh and gas up, may be much too close to your entrance on the return trip to warrant a stop," commented one engineer. Reason for the auto overpass: Experiments with across-the-road facilities connected by pedestrian tunnels or overpasses shows that the average motorist won't walk the distance.

The change in width of the median area is in line with the Authority's decision to add any future traffic lanes on the inside of the road, rather than to face reconstruction of access roads, acceleration-deceleration lanes, curbs and planting, when a lane is added on the outside.

Older specifications called for a 44-ft average width on the median, with a 20-ft minimum. New specifications prescribe a 104-ft width on the average, with a minimum of 80 ft.

94 MILES OF PILING

for munitions-handling facilities



driven by

McKIERNAN-TERRY

PILE HAMMERS

The $23,000,000 Sunny Point terminal built for the U. S. Corps of Engineers on the Cape Fear River near Wilmington, N. C., was designed to assure maximum safety in loading ammunition aboard vessels.

The facilities include three wharves, each 2,200 ft. long, resting on reinforced concrete piles with a total length exceeding 470,000 ft. and driven to a penetration to take 100 tons. Diamond Construction Company of Savannah, Ga., the contractor for the wharves and approach trestles, used McKiernan-Terry Pile Hammers for all pile-driving operations on this critical project.

Contractors all over the world similarly depend on McKiernan-Terry pile-driving equipment on foundation work for every conceivable type of job. Write for bulletins describing the details of design and performance records that explain this wide preference for McKiernan-Terry Pile Hammers and Extractors.

McKiernan-Terry 11-B-3
Double-Acting Pile Hammer

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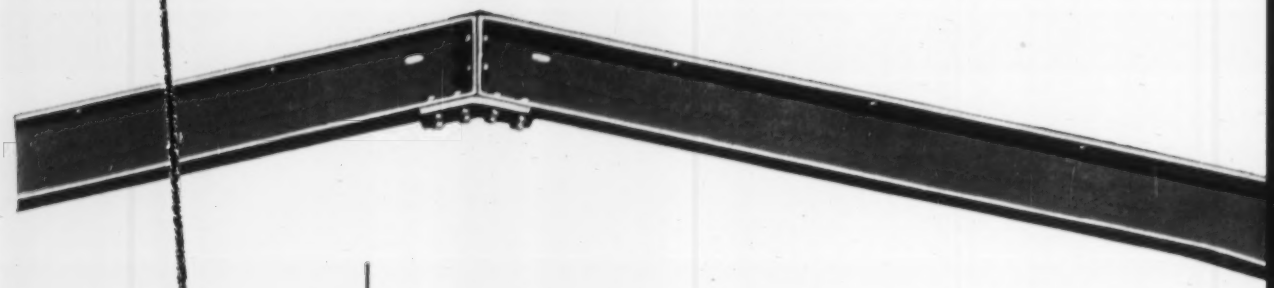

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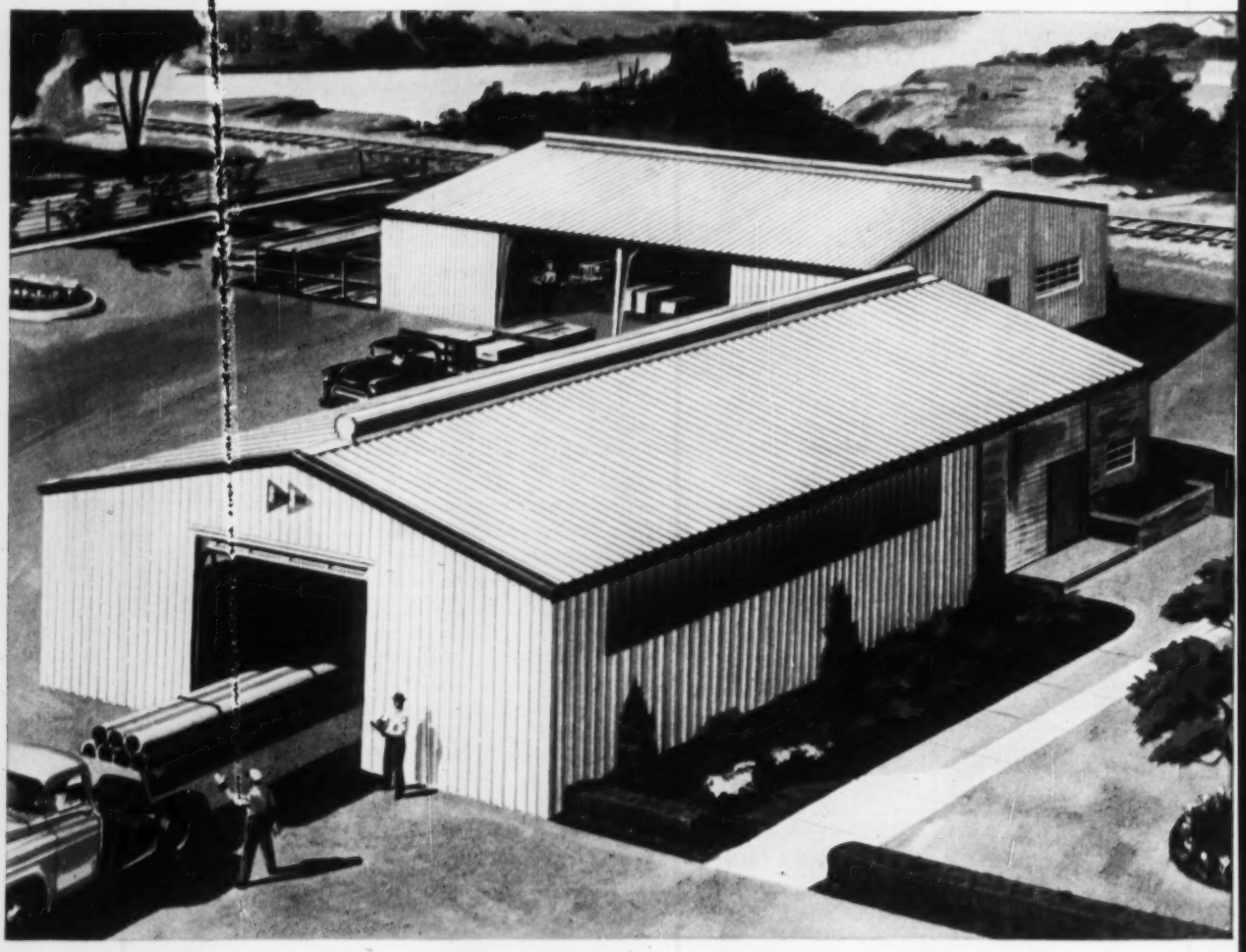

Stran-Steel Corporation, Ecorse, Detroit 29, Michigan

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Building Line

New Stran-Steel Rigid Frame buildings have the look of quality never before achieved in an all-steel building. However, quality doesn't stop with appearance. It is built right into every part of the structure.

Start with the smart *Stran-Satin* exterior finish. *Stran-Satin* metal wall, exclusive with Stran-Steel, provides a strong, durable panel with the weather resistance of zinc-coated steel and the smooth spangle-free look of far more expensive materials. Peaks, gables and eaves are completely enclosed with a weather-tight, roll-formed steel fascia flashing easily installed with self-tapping screws.

Under this smart appearance is a rugged, steel structure. At the peak and knee, the continuously welded Rigid Frame I-section steel plate beams are securely bolted together. The frame is designed to put these assembly bolts primarily in shear rather than tension. At the foundation, each Rigid Frame column is permanently bolted directly to the foundation with U-shaped anchor bolts.

Stran-Steel Rigid Frame buildings are clear-span structures available in widths of 40, 50, 60, 70, and 80 ft. and multiples thereof. These buildings can be site-styled to individual requirements because they are built in 20-foot bays.

Unlimited design possibilities make these versatile buildings ideal for warehouses, processing plants, factories, retail operations or as service centers. Fast, accurate assembly is made possible by precision punching and die forming. You get the cost-saving features of a pre-engineered structure in a quality building which is durable, fire-safe, easy to insulate and heat.

For complete engineering details, call your local Stran-Steel building dealer or send for the new catalog.

Sturdy frame construction—Exclusive Stran-Steel tapered design puts maximum strength where it is needed most. Columns and rafters are tapered for proper distribution of stress. All structural elements are shop punched for rapid bolting assembly.

Strong foundation—Rigid Frame columns are bolted directly into the foundation with ¼" diameter U-type anchor bolts embedded 10 inches into the concrete.

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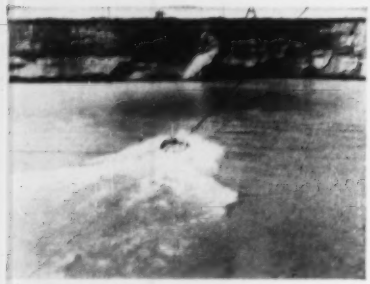
Sauerman Scraper Eliminates a Shift

• Digs 250 Tons Per Hr.



• 400 Ft. From Hopper, 30 Ft. Below Water

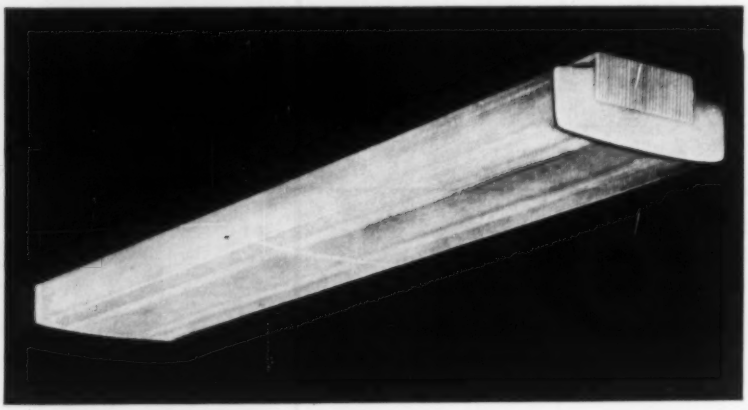
A 4-yd. Sauerman scraper machine gives Union Sand & Gravel Co. the production necessary to supply increased plant needs in just one shift. Two were required for their former installation, where a 2½-yd. scraper and smaller hoist were used.

The scraper is powered by a Sauerman three-drum air controlled hoist. The third drum is used to shift the tail block and trolley traveling on the rapid shifting bridle cable. This cable spans 200 ft. between tail towers. The tail trolley provides a method of laterally shifting the Crescent Scraper. When the material is depleted, one or both of the towers are moved to a new location.

Sauerman can help you cut costs

Write us about your materials handling job. Chances are you can use the low cost Sauerman Method. Request Sauerman News No. 144 for more details on the Union installation, also Catalog A for specifications and plenty of on-the-job photos.

SAUERMAN BROS., Inc. 632 SO 28th AVE BELLWOOD ILLINOIS



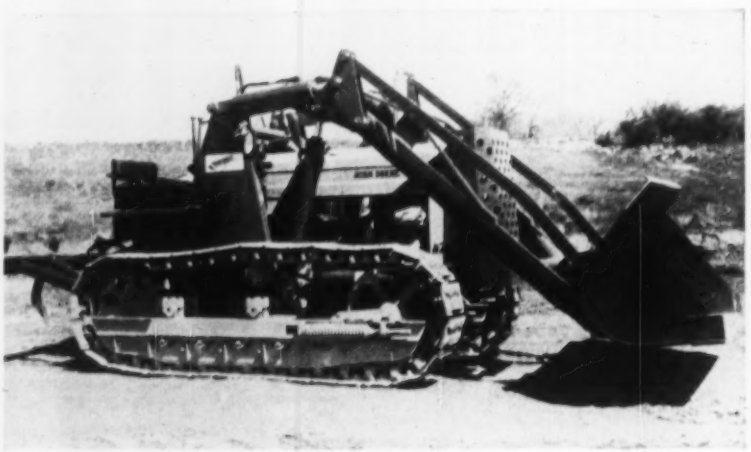
Fixture Offers Better Light Control

Called "Realite," available in 4- and 8-ft lengths, a new fluorescent fixture is said to offer the best in light control. Light is controlled in all directions by a hinged prismatic enclosure.

Separately trade named "Prismalume", the light-controlling enclosure gives a high level of downward light plus an indirect component along the ceiling. According to the manufacturer, the fixture eliminates all glare from the direct viewing zone.

The 4- or 8-ft units when attached together form continuous runs without visible transverse supports. The luminaire's shallow 4¼-in. depth recommends it for low ceiling areas where recessing is not desirable. Each section may be installed directly on the ceiling with hanger straps, or pendant hangers are available. The fixture takes two 40-watt rapid-start fluorescent lamps in each 4-ft length.

Other advantages claimed are its low weight, strength, ease of cleaning, and shatter-free glass. Holophane Co., Inc., 342 Madison Ave., New York 17, N. Y.



Tractor-Shovel for John Deere Crawlers

The Henry TS-40F industrial tractor shovel has been tested for use on the 420 and 40 crawler tractor made by John Deere, according to the Henry Manufacturing Co. Special features of the machine include a self-leveling bucket, solid steel lift arms, larger parallel-circuit valves and full-flow oil filter. The large steel main frame serves as the oil reservoir. Lifting capacity to full weight is 3,000 lb, breakaway 5,000 lb. Henry Manufacturing Co., 1700 North Clay, Topeka, Kans.

Far-Sounding Signal Horn Powered by Carbon Dioxide

A portable self-powered signal horn that can be heard for more than half a mile over such places as construction sites, railroad rights-of-way and other locations has been introduced by the Falcon Alarm Co.

Called the Big Bertha, the horn is powered by carbon dioxide and is said to provide a warning signal comparable to that of a diesel engine horn. Sound output of the 40-lb horn is rated at from 116 to 122 decibels at a distance of 25 ft. Falcon Alarm Co., Inc., Summit, N. J.

Back-Up Alarm for Truck Automatic, Gravity-Operated

An automatic, mechanical safety back-up alarm for trucks is operated entirely by gravity, and has no wires.

Developed by the Max von Radics and William Bookwalter, of the Heavy Duty Repair Shop of the Miller Construction Company in Anchorage, Alaska, the machine has been further developed by E. D. Bullard Co. The alarm is self-contained, easily attached directly to the rear wheels of all dual-wheeled vehicles with full floating axles. It rests directly upon the heads of the bolts that hold the axle in place. The alarm is a six-inch metal bell mounted on a steel plate, and is installed on the axle hub. It is sounded by four heavy metal hammers striking the bell once every quarter revolution when the wheel is in reverse motion. When the vehicle is moving forward there is no sound since the hammers fall against rubber stops and remain in that position by centrifugal force. E. D. Bullard Co., 275 Eighth St., San Francisco 3.

Asphalt Coating Used To Seal Pipeline Wrapping

A coated tape for field wrapping of joints and fittings of underground pipelines is now available. Provided with an asphalt coating on inner and outer surfaces, the tape is composed of glass-fiber mat. The Duratape wrapping is also able to be installed with a coal tar coating. L. O. F. Glass Fibers Co., 1810 Madison Ave., Toledo 1, Ohio.

Curb Paver Is Automatic Eliminates Need for Forms

A heavy-duty automatic curb paver that is said to lay 90% compacted bituminous curbing in one pass and eliminate the need for curbing forms is now in production.

Self-propelled, the machine utilizes exhaust from its own engine to preheat and blast-clean the surface on which the curbing is to be laid, sometimes eliminating the need of a tack coat. Speed ranges 4 to 6 ft of curb per min depending on the compaction desired, the size of the mold and consistency of material.

An exchangeable mold is said to be sufficiently offset from the rest of the machine to lay curbing at the exact edge of the pavement or within one inch of any obstruction, and the engine exhaust gases, passing through a heat jacket surrounding the mold, produce curbs with smooth ironed surfaces. Compaction equals that by a 12- to 15-ton roll, the maker says. E. D. Etnyre & Co., Oregon, Ill.

(*New Products continued on page 58*)

Foundations, Floors, Reservoirs, Other Concrete Structures Can Be Made to Last Longer!

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Zilicon Waterproofing Paste, added directly to the "mix," distributes itself evenly throughout the concrete and provides uniform water repellency and increases workability. By minimizing the absorption of water, you insure the life of the concrete against damage from its worst enemy.

Truscon Zilicon has been used to waterproof concrete in construction projects all over the world. Added to Portland cement mortars and concrete mixes, it also provides these benefits . . .

- Makes concrete more resistant to freezing and thawing, wetting and drying
- Lubricates the mix, makes for easier workability, easier flow
- Reduces tendency to "honey-comb," saving the after-cost of patching
- Contains no lime, clay or other extenders added solely for bulk or weight

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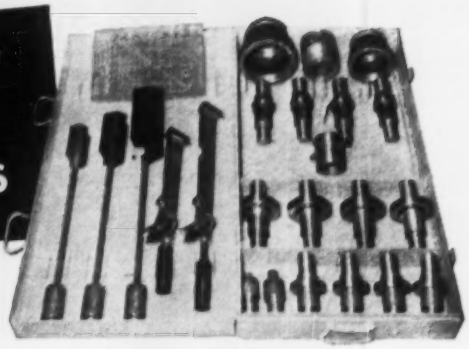
"IN-PLACE" SHEAR READINGS



FAST, ACCURATE, WITH NEW ACKER VANE TEST KIT!

The Acker Vane Shear Test Kit has everything needed to obtain fast, accurate, "in-place" shear readings to depths of 100 feet!

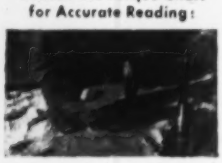
It's easy to use and provides accurate soils information at low cost! For ease in carrying, the entire set of tools are packaged in a handy steel kit.

Write today for prices and free illustrated folder 700! ENR

Assemble the Vane to the Rod!

Insert in Casing and Apply Pressure to the Torque Wrench!

Consult the Torque Chart for Accurate Reading!

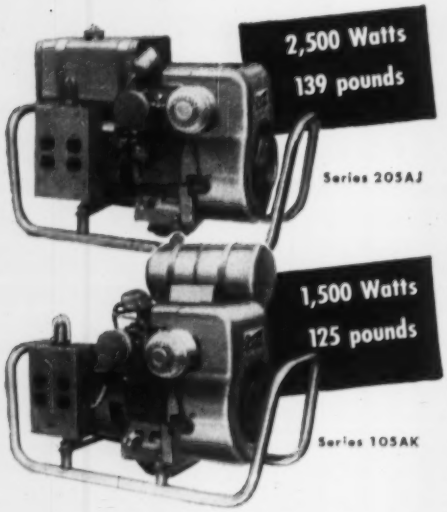


ACKER DRILL CO., INC. 725 W. Lackawanna Avenue Scranton, Penna.

a complete line of Soil Sampling Tools, Diamond and Shot Core Drills, Drilling Accessories and Equipment

YOU GET *4-cycle* DEPENDABILITY AND *Light weight* TOO . . . IN AN

ONAN Electric Plant



These power-packed electric plants give you all the *4-cycle* advantages of quick starting, long life and trouble-free operation . . . with an amazing weight saving over usual 4-cycle plants. You can carry them easily to any spot . . . and you can count on them delivering their full rated capacity as long as you need it. Both are single-cylinder, air-cooled . . . completely equipped and ready to go.

Other models to 50,000 watts.

Write for special folder on lightweight models!

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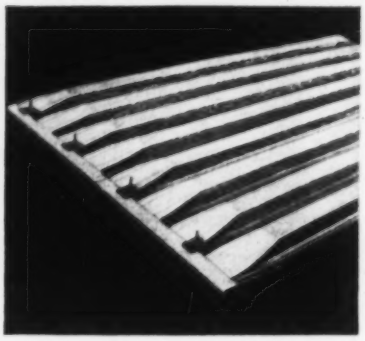


Expendable Metal Forms For Concrete Bridge Decks

Bridge erection schedules are said to be speeded up by the use of a new corrugated steel form for concrete decks that is left in place.

The forms consist of galvanized steel panels, 24 in. wide, which are trapezoidally corrugated. Trade-named "Leave-in-Place" forms, they are custom-made to suit the particular bridge.

Designed especially for spans involving high or hazardous conditions, the panels are said to eliminate the need for wood forms, shores and safety nets. According to the manufacturer, sections can be installed at the site by a small crew and require no equipment other than hand tools. UNITED STEEL FABRICATORS, INC., WOOSTER, OHIO.

Tough ⅛-In. Floor Topping Resists Corrosion, Skidding

Called "Chem-Top," a new chemical-resistant floor topping is recommended for food, chemical, creamery, dairy, brewery, and other plants having severe floor-corrosion problems. It is applied by trowel to a thickness of ¼ in. or less over new or old concrete, brick, quarry, tile, metal or wood.

Chem-Top consists of chemically inert aggregate and a catalyst-hardened inorganic plastic binder. A coarse-aggregate variation of the product is available for filling holes in concrete prior to topping.

According to the manufacturer, Chem-Top sets rapidly to give a floor that is dense, hard-wearing, slip resistant, and resilient. It is said to be highly chemical resistant. Laboratory samples in prolonged tests have shown no decomposition by such chemicals as concentrated hydrochloric, nitric and acetic acids. It has also stood up very well in tests in food and dairy plants.

Claimed to be four times tougher

than concrete itself, the topping is available in colors of red, gray, green, cement, white and black. THE GARLAND CO., 2748 EAST 91ST., CLEVELAND 5, OHIO.

Engine-Driven Welder Unit Built for Heavy-Duty Service

A new engine-driven welder, with battery start and direct coupling between engine and generator has been introduced by G.E.'s welding department.

The machine is available in 300- and 400-amp models, and includes a reversing switch, battery start and side panels as standard equipment. Built for heavy service, the welder is of extra-heavy steel and has no projecting generator or controls, to minimize damage on the job operation. The 300-amp unit, called 30AG, has a welding range of 60 to 375 amps, and electrode capacity of $\frac{1}{8}$ to $\frac{5}{16}$. The 40AG, rated 400-amps, has an operating range of 80 to 500 amps, and electrode capacity of $\frac{1}{8}$ to $\frac{3}{8}$. GENERAL ELECTRIC CO., WELDING DEPT., SCHENECTADY 5, N. Y.

Dual-Action Dozer Blade For Small Utility Tractor

A dual-action dozer for the new International-Harvester IHC-300 utility tractor has been put into production by the Arps Corp.

Named so because of the double-acting hydraulic cylinder on the blade, the dozer can be used in a large variety of jobs, according to the manufacturer, including removing topsoil and backfilling, grading, bulldozing, and even shallow excavating.

A wide range of blade adjustments adds to the versatility of the unit. There are five angular adjustments for the blade so that it may serve as either a bulldozer or as angle-dozer. There are also three adjustments for the cutting pitch. ARPS CORP., NEW HOLSTEIN, WIS.

Two-Ply Layout Tape

Advantages claimed for a new transparent layout tape are based on its two-ply construction. Symbols printed on top of the bottom layer are protected from contact at all times—no scratching during unrolling, clear and sharp print always. The pressure-sensitive tape has a larger adhesive area since there is no printing on the adhesive side. No backing strip is required. LABELON TAPE CO., 450 ATLANTIC AVE., ROCHESTER 9, N. Y.

DIESELS *that dig...*

Mainland Construction Co., Texas City, Texas, using 155 Trenchliner powered by Model 195-DLCU Waukesha Diesel

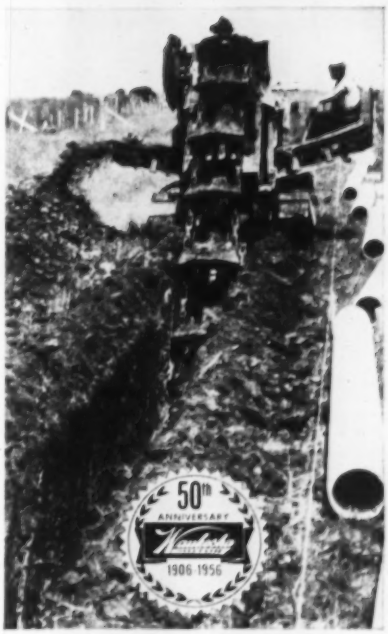
Waukesha 195-DLCU Diesel up to 81 hp

PARSONS 155

TRENCHLINER

powered with

WAUKESHA



● Compact, low and narrow, this Parsons 155 goes where other trenchers can't. Its Waukesha Dynamic Diesel power unit gives it high capacity for digging, 16 to 26 inches wide—8 feet deep. You get 30 digging speeds (60 optional) from 5.8 inches up to 25 lineal feet per minute. At low range Trenchliner inches its way past cross pipes, through rock and other underground obstructions. At high range it makes the maximum feet-per-minute cross country. The Waukesha 195-DLCU Diesel is a 6-cyl., 302 cu. in., 4 x 4-in. power plant—prompt to start, quick to respond, economical to run, ruggedly reliable. Get Bulletin 1625.

WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN
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320

T.G.Mooney Appointed Director Of Alaska Public Works

Thomas G. Mooney has been appointed director of Alaska public works with headquarters in Juneau. He is charged with administering a 10-year $70 million program of public works in Alaska—started in 1949—being carried out by the Office of Territories of the Interior Department. The federal government and local public bodies share equally in the cost of constructing schools, hospitals, and water and sewerage systems.

Mooney has been serving as director of a similar federal public works program in the Virgin Islands since 1945. In Alaska, he succeeds James W. Huston, who recently resigned.

Delaware's "Orphan Roads" Are Given New Guardian

Francis J. Sentman, New Castle, Del., formerly superintendent of maintenance at the Delaware Memorial Bridge, has been transferred to the Delaware State Highway Department as supervisor of the department's newly created Suburban Road Division.

The suburban road plan, instituted by the highway department under authorization of the current general assembly, calls for bringing about 100 miles of suburban roads in Delaware home developments up to highway department standards.

Known as "orphan roads", most of those under Sentman's jurisdiction were built in suburban developments before the state's suburban road act went into effect.

Highway Coordinator Named For Oregon Capital City

City traffic engineer Fred T. Fowler, of Portland, Ore., has been assigned to the newly created post of city coordinator of highway engineering to work with agencies handling accelerated construction of Oregon freeways, city streets of Portland and roads in neighboring counties.

Stepped up as a result of the new federal highway program, construction of main trunk routes in the metropolitan area calls for federal expenditure of as much as $138 million during the next 13 years.

Pending civil service examination, assistant traffic engineer William J. Weller has been named acting chief.

J. E. Wiley

J. H. Acuff

Both ARBA and AASHO Get New Staff Executives

John E. Wiley, assistant executive secretary of the American Association of State Highway Officials since 1950, will become managing director of the materials and supplies division of the American Road Builders Association on August 1.

An active highway engineer, since 1925 in highway departments of Wyoming and North Dakota, Wiley's duties with ARBA will be administration of staff work on materials specifications, standardization and technical investigations. He also will initiate remedial action in event of supplies shortages.

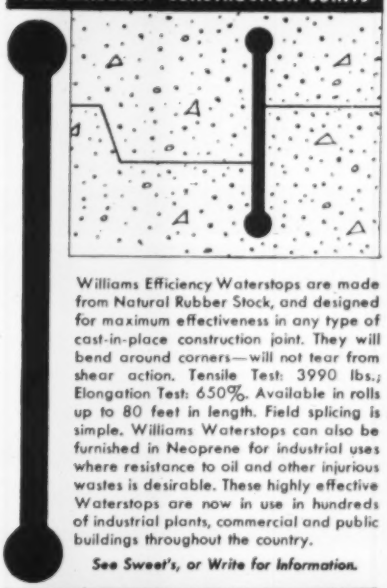
Replacing Wiley in his AASHO post will be John H. Acuff, for the past 12 years secretary of the Missouri State Highway Commission. A 29-year veteran of the Missouri highway department, Acuff was district right-of-way agent at the time of his elevation to commission secretary.

Two Stars for C. Rodney Smith

Another star, pinned on by Maj. Gen. Charles G. Holle, Acting Chief of Engineers, marks the promotion of C. Rodney Smith to the rank of major general. General Smith currently holds the post of Assistant Chief of Engineers for Personnel. A 1926 graduate of the U. S. Military Academy at West Point, General Smith took his civil engineering degree from Cornell University in 1930, following three years of service with the Corps of Engineers in the Southwest.

After serving with the Corps in various positions, he was assigned to the post of Chief of the Engineering Branch in charge of NATO construction, in 1951. He has served in his present capacity since 1954.

RUBBER
WATERSTOPS
FOR MASONRY CONSTRUCTION JOINTS



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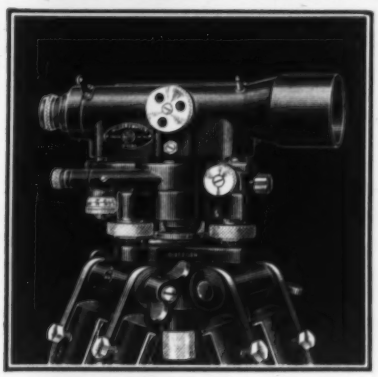

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DIETZGEN

Obituaries

M. Alfred Kaehrle, 47, consulting engineer, died at West Hartford, Conn. July 4. He was graduated from Sheffield Scientific School, Yale University in 1930. Mr. Kaehrle's first engineering job was with the Port of New York Authority, where he worked on the construction of the George Washington Bridge. He later became assistant director of the bureau of traffic planning and design in the Connecticut State Highway Department. A short time ago, he formed the consulting firm of Alfred Kaehrle and Associates.

Georges Rodzevitch, 55, a partner in the architectural firm of James R. Edmunds, Jr., Baltimore, Md., died July 11. Born in St. Petersburg, Russia, and educated at the Imperial Law School and University of Belgrade, he came to this country in 1929. He continued his education here by taking a course of study in architecture. Mr. Rodzevitch joined the Edmunds firm in 1941, and had designed many residences and commercial buildings, principally in the Baltimore area.

Col. Roy G. McGlone, 70, retired chief of operations for the Corps of Engineers at Dallas, died recently at Dallas. A native of Mt. Pleasant, Mich., Colonel McGlone was commissioned in the Corps during World War I, and in World War II was chief of the engineering division of the Persian Gulf Command.

Ernest J. Russell, 86, retired architect and former president of the American Institute of Architects, died July 11 in St. Louis, Mo. Immigrating to this country from England as a boy, Mr. Russell began his career as an architect in 1898 in St. Louis, later became chairman of the city planning commission there.

S. G. Nowell, 59, a member of the engineering staff of Gannett Fleming Corddry & Carpenter, Inc., and formerly a member of the engineering staff of the Pennsylvania Turnpike Commission, died recently at his home at Ocean City, N. J.

Jonothan B. John, 86, chairman of the board of the Medusa Portland Cement Co. since 1951, died July 16 at his home in Cleveland.

John D. Gallagher, 64, civil engineer for the California Division of Highways for more than 30 years, died recently at his home in Sacramento.

McConnaughay
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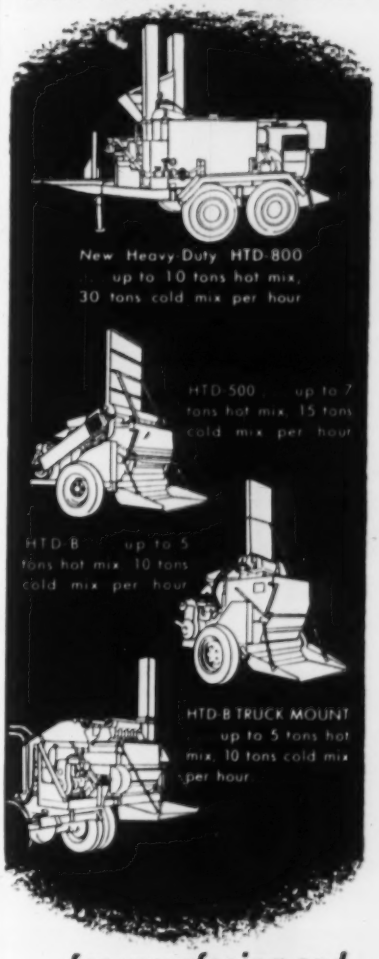
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30 tons cold mix per hour
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HTD-B up to 5 tons hot mix, 10 tons cold mix per hour
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Where the Building Dollar Goes

Cost Range for Seven Buildings

Type of building	Per sq ft of floor area Min	Aver	Max	Per cu ft of volume Min	Aver	Max
Office building, Bridgeport, Conn	$10.80	$12.18	$14.40	$1.80	$2.03	$2.40
Office building, Tucson, Ariz	13.60			1.32		
Office building, Phoenix, Ariz	12.04			0.924		
Office building, Kansas City, Mo	14.50			1.29		
Department store, Suburbia, N. Y.	14.80	16.00	17.09	0.85	0.92	0.98
Hospital, Suburbia, N. J.	12.29	13.52	15.65	1.10	1.21	1.40
Apartment house, Pittsburgh, Pa		14.30			1.30	

. . . And what these Dollars Buy

Type of building	Office Buildings				Dept Store	Hospital	Apartment
Type of const, frame outside walls	Steel Brick	Steel Brick	Conc Steel Brick	Conc Bk & Alum	Steel Conc Brick	Steel Brick	Steel Brick
Date construction started	mid '56	June '56	Mar '54	Jan '54	Aug '55	Feb '56	Aug '54
Location of building	Bridgeport, Conn.	Tucson, Ariz.	Phoenix, Ariz.	Kansas City Mo.	Suburbia N. Y.	Suburbia N. J.	Pittsburgh, Pa.
Height, stories	2	9	9	16	2 & B	1 & B	8
Floor area, sq ft	30,000	98,600	254,000	311,200	135,000	170,000	122,000
Volume, cu ft	180,000	1,041,800	3,311,000	3,500,000	2,350,000	1,900,000	1,320,700
% air conditioned	4	100	100	100	90	.....	.....
Principal Items of Cost				% of Total			
Excav & site improvement	2.30	2.03	2.42	1.23	2.50	2.65	2.52
Foundations	7.10	2.32	2.02	1.31	8.55	12.38*	3.95
Structural frame	15.10	19.18	19.13	21.25	7.85	1.62	19.36
Cement finish work		2.65	2.05	1.23		•	0.86
Exterior masonry	12.20	10.09	8.68	2.78	13.10	•	9.92
Metal wall panels				10.55			
Interior partitions	10.70	1.08	3.54	2.62	0.60	0.29	6.51
Carpentry & millwork		1.99	1.98	1.55	0.50	0.96	4.43
Sash & glazing	1.70	2.71	1.45	0.26	1.30	4.79	1.70
Doors	4.00	2.51	1.20	0.87	1.00	0.20	0.28
Roofing	2.50	0.67	1.52	0.32	2.72	3.86	0.39
Insulation		0.14	0.14	0.55			0.33
Waterproof & dampproofing		0.39	0.46	0.55		0.15	
Met lath, furr & plastering	4.50	5.80	5.62	1.99	8.80	2.12	12.55
Hollow metal work		0.42	0.43	0.32	0.90	0.28	2.15
Misc iron and ornamental met	3.20	5.82	2.13	4.59	8.92		0.67
Tile, terrazzo & marble		0.94	1.13	1.89	0.36	5.20	2.22
Floor covering	2.20	0.23	0.14	0.52	0.38	0.50	2.51
Painting	3.20	0.35	0.85	0.92	0.74	0.90	0.80
Finish hardware	0.30	0.36	1.42	0.18	0.29	0.90	0.44
Acoustical ceilings		0.47	1.24	4.72	0.41	1.50	
Plumbing	6.90	20.67	4.07	3.15	3.29	10.80	7.70
Heat, ventil & air cond	14.30		20.66	17.84	16.52	9.20	6.59
Ele work & light fixtures	9.80	7.94	8.86	8.13	13.20	8.50	5.08
Elevators & dumbwaiters		11.50	8.86	10.68	5.00	0.50	3.50
Incidental work							1.14
General conditions						8.90	
Paving					1.50	1.00	
Sprinklers					2.56		
Intercom syst & television							0.19
Unusual features		(to tenant subdivision work					1.49
Equipment						2.10	2.72*

*Foundations include all concrete work & all masonry paving • rolling steel doors • includes moving stairs *exterior • kitchen equipment

Office building prices in this table range from a minimum of $10.80 per sq ft for a 2-story structure to $14.50 per sq ft for a 16-story building. The 9- and 16-story buildings are fully air-conditioned. Plumbing, heating and air conditioning account for 20.67%, 24.73% and 20.99% of the cost. Electrical and light fixtures take 7.94%, 8.86% and 8.13% of the construction budget.

Costs of a suburban department store within the Metropolitan area of New York range from $14.80 to $17 per sq ft. It is 90% air conditioned, with 16.52% of the cost going for heating, ventilating and air conditioning. Electrical work and lighting fixtures account for 13.2%—the highest ratio in this category for the buildings shown.

These building cost structure reports for seven buildings add geographical range and up-date unit prices for the fourth in this series of reports on "Where the Building Dollar Goes".

These are published through the courtesy of Industrial Estimating Service, New York, N. Y., James Stewart Co., Phoenix, Ariz., and Siesel Construction Co., Milwaukee, Wisc.

Preceding reports in this series were in ENR Oct. 8, 1953, pp. 148 to 149; Sept. 29, 1955, p. 212; July 5, 1956, p. 137, through the courtesy of Turner Construction Co., New York, N. Y., D. F. Denman, Memphis, Tenn., E. L. Daniels, Arlington, Va., Rose Construction Co., Abilene, Tex. and Henry A. Knott, Inc., Baltimore, Md.

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Aug. 9—Cement, Aggregate, Ready-mixed Concrete, Asphalt
- Aug. 16—Iron and Steel Products, Pipe
- Aug. 23—Wood Products, Glass, Explosives, Chemicals
- Aug. 30—Clay Products, Lime, Plaster, Paint, Roofing

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	GYPSUM PLASTER BOARD tapered edge per Msq ft ½"	⅝"	GYPSUM BOARD LATH plain or perf per Msq ft ⅜" x 16" x 48"	GYPSUM SHEATHING tongue & groove per Msq ft ½" x 2' x 8'	FIBER BOARD SHEATHING asph impreg & coat per Msq ft ½" sq ed	½" T&G	FIBER BOARD INSULATION sq edge, paint per Msq ft ½"	MINERAL WOOL INSULATION† loose, per 40-lb bag a	3" batts per M sf	GLASS FIBER INSULATION† loose, per 40-lb bag a	3" batts per M sf	ALUMINUM FOIL 60# Kraft 1 side foil per roll of 250 s. f.	Expansible Blanket 2 layers foil per Msq. ft
Atlanta	$70.00	$80.00	$43.00	$70.00	$70.00	$127.00	$27.00	$1.00	$90.00	$1.65b	$65.00	.....	.....
Baltimore	51.25f	44.75f	32.55f	55.00f	65.00f	108.50f	69.00f	1.30	66.50	1.60	45.00	$4.00g	$33.50
Birmingham	65.00	84.00	47.77	75.00	80.00	134.00	79.00	1.40	70.00	1.60	75.00	2.99g	.....
Boston	56.00m	46.50m	33.00m	52.00m	64.00m	109.00m	79.00kn	1.45	75.00	.....	53.00	6.00	55.50
Chicago	55.00	52.00	43.00	60.00	80.00	120.00	80.00	1.55	80.00	.....	63./65bb	5.25r	.....
Cincinnati	46.40nz	41.60nz	30.80nz	49.81w	67.50nz	120.00nz	70.00nz	1.25	60.00	1.25	73.50	2.84	50.00m
Cleveland	50.50	55.00	40.00	65.00	70.00	111.00	70.00	1.35/1.50	75.00	1.60**	57.50**	17.50*	50./55
Dallas	58.00	55.00	42.50	65.00	73.50	122.50	70.00	1.90	85.00	1.35	65.83	4.25	.....
Denver	62.00	54.50	41.00	62.00	75.90	126.00	74.90	.....	71.00s	1.20r	55.00	11.00r	21.00
Detroit	59.00	53.00	36.00	57.50	58.50	98.00	57.50	.....	.....	1.95b	89.00r	.....	.....
Kansas City	55.00	55.00	40.00	65.00	72.00	120.00	75.00	1.40	80.00	1.40	80.00	11.24df	19.44
Los Angeles	60.00	52.50	0.325z	60.00	71.87	121.25	80.00	.....	83.00	1.35z	64.00	4.20g	.....
Minneapolis	80.00	70.00	0.40z	80.00	70.00	140.00	78.00	1.60	80.00	1.80	80.00	6.50	.....
Montreal	56.00	48.00	36/39	53.00	60.00	.....	63.00	1.30	58.00	1.30	56.00	23.00e	86.00
New Orleans	55.00	48.00	45.00	70.00	75.00	125.00	72.50	1.75	68.00**	.....	.....	.....	.....
New York	52.00	45.50	35.00	53.00	69.00	109.00	70.50	1.55	65.00	1.90b	67.00	5.20	48.80ee
Philadelphia	50.00	48.00	34.00	48.50	67.50	105.00	49.20	.....	63./70	.....	70./75	5.50/6.34	50./44.50
Pittsburgh	65.00	55.00	40.00	68.00	65.00	105.00	60.00	1.90	72.00	1.90	72.00	4.10	.....
St. Louis	62.00	55.00	39.00	65.00	70.00	115.00	75.00	1.60	80.00	1.65	62.00	4.75d	.....
San Francisco	52.00c	44.75	0.34z	56.00	59.00	99.00	58.00	1.60	66.50	1.55	66.50	4.82	53.50
Seattle	63.50	57.50	46.50	63.50	72.50	122.00	71.50	1.75g	79.00	1.80aaz	54.00aa	4.25g	46.50
Toronto	61.00	50.00	40.00	64.50	75.00	.....	.....	0.90	51.00	.....	51.00	16.10e	43.65

*a for hand packing *b per 30# bag *c carloads *d 40# kraft paper *e 20# sq ft bag, 4" thick *f full trailer loads *g 80# kraft paper backing *h LCL *i flameproof $75.00 *m 10 ton quantities *n distributor's siding *o per Msf roll *p per sf *r per cwt *s per 35# bag *t per M sq ft *w fob city *x per sq. yd. *y 26# bag *z 32# bag *aa fob warehouse *bb 2" *cc in 250 sf rolls, of 16", 20", or 24" width.

HOURLY WAGE RATES—Base rate + fringe benefits

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor Building	Common Labor Heavy Const
Atlanta	$3.35	$2.80	$3.05	$2.70	$3.00	$3.10	$3.05+10¢e	$1.45	$1.45
Baltimore	3.45+10¢e	2.95+7½¢e	3.50+7½¢e	2.70./2.95+10¢d	3.25+7½¢e	3.30	3.20+7½¢e	1.60+7½¢e	1.60+7½¢e
Birmingham	3.50	2.60	3.00+7½¢e	2.42	2.92	3.175	3.05+7½¢e	1.50	1.60
Boston	3.50+10¢e	3.05+10¢e	3.55+7½¢e	3.50	3.50+20¢e	3.20+12e#	3.20+10¢e	2.30+7¢e	2.30+7¢e
Chicago	3.62½+7½¢e	3.35+10¢e	3.55+7½¢e	3.25+5¢m	3.54+23¢e	3.48+21¢e	3.37+22¢e+2	2.57½+7½¢e	2.57½+7½¢e
Cincinnati	3.60	3.30	3.35+7½¢e	3.075/3.325	3.375	3.50+3¢e	3.50+9½¢e	2.35	2.25
Cleveland	3.55+10e	3.575	3.50+7½¢e	3.575	3.575	3.60	3.375+10¢e	2.825	2.75
Dallas	3.70	2.875	3.075	3.00+7½¢e	3.437+7½¢e	3.12½+7½¢e	3.10+7½¢e	1.55	1.55
Denver	3.625	3.075	3.00+7½¢e	2.93	3.30+7½¢e	3.00	3.17+15e#	2.00	2.00
Detroit	3.53+20¢ee	3.20+20¢e	3.47½+20¢e	3.30+15ee	3.51+24¢e	3.50+30½e#	3.295+22½e#	2.50+15ee	2.55+10¢e
Kansas City	3.70	2.90	3.075	3.065	3.375	3.20+13e#	3.15+7½e#	2.155	2.18
Los Angeles	3.80	3.00+10¢e	3.25+7½¢e	2.95+10¢e	3.625+12½e#	3.45	3.525+10¢e	2.30+7½¢e	2.30+7½¢e
Minneapolis	3.425	3.00	3.17	2.95	3.05+23½ee	3.12e	3.00+20ee	2.25	2.25
New Orleans	3.325	2.75	3.00+7½¢e	2.87½+7½¢e	2.80+5ee	3.025+7½e#	3.00+10¢e	1.55	1.55
New York	4.05+36¢f#	3.65+272¢f#	3.95+34¢e	3.90+31¢f	4.00+50¢e	3.50+39¢e#	3.85+35¢f#	2.60+21¢f	26.0+21¢f
Philadelphia	3.75+17¢e	3.385	3.55+18¢e#M	3.15½/3.90½+10¢e	3.65+15e#	3.77+15¢ee	3.75+11¢e	2.10	2.40
Pittsburgh	3.60+17½¢e	3.325+7½¢e	3.30+7½¢e	3.35+7½¢e	3.40+17½¢e	3.50	3.425+7½¢e	2.25+5e	1.98+10¢e
St. Louis	3.80	3.25+19¢e	3.25+7½¢e	3.325	3.425+7½¢e	3.50+25e	3.525+10¢e	2.30+7½¢e	2.30+7½¢e
San Francisco	3.75+12½¢e	3.18½+10¢e	3.25+10¢e	2.98+10¢e	3.56+10e	3.22½+20¢e	3.20+30¢e	2.325+10¢e	2.325+10¢e
Seattle	3.55+10¢e	2.80+10¢e	3.07+10¢e	2.90+10¢e	3.27½+10¢e	3.10+19½e#	3.15+21¢e	2.37+10¢e	2.37+10¢e
Montreal	2.10+14¢t	1.90+14¢t	2.00+14¢t	1.80+14¢t	2.12+18¢t	2.10+18¢t	2.12+18¢t	1.30+10¢t	1.30+10¢t
Toronto	2.61+10¢**	2.40+10¢**	2.40+10¢**	2.50+10¢**	2.45+16¢**	2.65+10¢**	2.44+10¢**	1.45+6¢**	1.45+6¢**

ENR Skilled Average (Bricklayers, Carpenters, Iron workers): $3.405. **ENR Common Average** $2.192

* Cost of living bonus now included in basic wage. † 8% fringe benefits. ** 4% vacation fund. *a 8 hr. day. *b 7 hr. day. *c 3% vac. stamp fund plus 7½¢ WF for bricklayers; 4% VF for electricians plus 8¢ WF, 1% PF. *d 10¢ H&WF. *e 10¢ VF. *f 6% WF. *g 11½¢ WF. *h $2.85 homes & housing plus 7½¢ WF. *i 17¢ WF. *j 10½¢ hr. WF. *k 7½¢ hr. WF. *l4½ VF. *m 5¢ hr. WF. *n Plus 11% fringe benefits on gross wage ea. yr. *o 10¢ PF. *p 3% WF, 3% PF. *q 10¢ ins; 6% vac. and holiday pay. *r 4% WF and 20¢ PF. *s 5% W&PF, 4% VF, 1½ NC, 6 PH. *t 7½¢ H&WF. *u 1½% PF. *v 10¢ WF. *w Negotiating. *x 5¢ VP. *y 23¢ WF. *A 15¢ WF, 15¢ PF, 20¢ B.F. *C 18¢ WF, *D 10¢ H&WF, 5¢ organ. *E 6% WF, plus travel pay per day. *F Plus $4 per day Annuity contrib. *G 3¢ Prom. *H 7¢ WF, 6% VF. *I 15¢ H&WF, 5¢ for Advtg. *J 5% WF, 6 PH. *K 11¢ WF, 12½¢ VF, 10¢ PF. *L 3% WF, 3% PF, 2% VF, 1% EF. *M 7½¢ PF. *N 1% WF. *O 10¢ WF, 1% PF. *P 10¢ hosp. ins.; 5¢ vac., 5¢ VF. *Q 1 drum, 2 drums 3.40/3.55 + 10¢*R 12¢ WF and 1¢ apprentice *S 12½¢ H and WF. *T 21¢ H, W & VF. *U 7½¢ WF, 4% VF. *V 8% WF, 3% PF. *W 2% F. *X 12¢ VF, & 7½¢ H & WF. *Y 7¢ H & WF. *Z 9½¢ WF. *aa 7¢ WF, 15¢ PF. *bb 8¢ WF.

	Truck drivers 1½ T	Truck drivers —4 cy	Truck drivers +4 cy	Tractor Operators incl. bulldozers 34-49 hp	Tractor Operators incl. bulldozers 70-100 hp	Tractor Operators incl. bulldozers 100 & over	Tractor scraper 15-18 cy	Power cranes & shovels ½ cy	Power cranes & shovels ¾ cy	Motor grader oper	Air comp oper	Air tool oper
Atlanta	$1.50	$	$	$2.525	$2.525	$2.525	$2.525	$3.05	$3.05	$2.525	$2.30	$1.67
Baltimore	1.60+7½¢e	1.75+7½¢e	1.85+7½¢e	2.85./3.30b	2.85./3.30b	2.85./3.30b	2.85./3.30b	3.40/3.55+10¢e	3.40/3.55+10¢e	2.85./3.30b	2.85./3.30b	2.25
Birmingham	1.60	1.79ff	2.05ee	2.56	2.56	2.56	2.70	2.70	2.70	2.61	2.285	1.65
Boston	2.195c	.....	.....	3.025d	3.025d	3.025d	3.025d	3.40	3.40	3.40	2.95	2.45+7¢e
Chicago	2.08+12f#	.....	.....	3.00+5¢e	3.15+5¢e	3.05+5¢e	2.85+5¢e	3.60+5¢e	3.60+5¢e	2.95+5¢e	2.95+5¢e	.....
Cincinnati	2.20ee	2.30ee	2.40ee	3.075	3.075	3.075	3.075	3.325	3.325	3.325	3.325	3.325
Cleveland	2.50+10¢e	2.50+10¢e	2.50+10¢e	3.325	3.325	3.325	3.325	3.575	3.575	3.325e	3.20	3.20
Dallas	1.55	1.55	1.55	1.55/2.625f	1.55/2.625f	1.55/2.625f	1.55/2.625f	1.55/2.625f	1.55/2.625f	1.55/2.625f	1.55/2.00f	1.55/2.00f
Denver	2.15	2.15	2.25	2.15	2.76	2.76	2.76	2.93	2.93	2.76	2.76	2.35
Detroit	2.45	2.45	2.45	3.30+10¢e	3.30+10¢e	3.30+10¢e	3.30+10¢e	3.30+10¢e	3.30+10¢e	3.30+10¢e	3.025+10¢e	2.68+20¢ee
Kansas City	2.115e	2.115e	2.19e	2.30	2.85e	2.85e	2.85e	3.095	3.095	2.71	2.85f	2.24
Los Angeles	2.405+7½¢e	2.405+7½¢e	2.435+7½¢e	3.05+10¢e	3.05+10¢e	3.05+10¢e	3.30+10¢e	3.30+10¢e	3.30+10¢e	3.30+10¢e	2.54+10¢e	2.51+7½¢e
Minneapolis	2.25	2.25e	2.40e	2.63	2.85e	3.07e	2.85	3.07e	3.33e	2.63	2.52	2.35
New Orleans	1.675	1.675	1.675	2.875	2.875	2.875	2.875	2.875	2.875	2.875	2.225	1.65
New York	2.12½+13ee	2.75+14e##	2.75+14e##	3.27½+262ee	3.27½+262ee	3.27½+262ee	3.40+272ee	4.15+332ee	4.15+332ee	3.40+272ee	3.40+272ee	3.00+15ee
Philadelphia	1.925/2.15+7½¢e			3.15½/3.90½+10¢e			3.15½/3.90½+10¢e			3.15½/3.90½+10¢e	2.97½+10¢e	2.13½+10¢e
Pittsburgh	2.20+7½¢e	2.20+7½¢e	2.20+7½¢e	2.87½+7½¢e	3.20+7½¢e	3.27½+7½¢e	3.025+7½¢e	3.35+7½¢e	3.35+7½¢e	3.25+7½¢e	3.35+7½¢e	2.20+7½¢e
St. Louis	2.30+7½¢eee	.....	.....	3.325kk	3.325kk	3.325kk	3.325kk	3.325kk	3.325kk	3.325kk	2.775kk	2.775kk
San Francisco	2.32½+10¢e	2.32½+10¢e	2.465+10¢	3.095+10¢e	3.095+10¢e	3.095+10¢e	3.095+10¢e	3.425+10¢e	3.425+10¢e	3.255+10¢e	2.705+10¢e	2.425+10¢e
Seattle	2.63+7½¢ee	2.63+7½¢ee#d	2.83+7½¢ee	2.78+10¢e	2.95+10¢e	2.95+10¢e	2.95+10¢e	3.36+10¢e	3.36+10¢e	3.10+10¢e	2.78+10¢e	2.52+10¢e
Montreal	1.30+10¢ff	1.30+10¢ff	1.30+10¢ff	1.73+14¢ff	1.73+14¢ff	1.73+14¢ff	1.73+14¢ff	1.99+16¢ff	1.99+16¢ff	1.73+14¢ff	1.80+15¢ff	1.60+15¢ff
Toronto	1.47+6ee	1.45+6ee	1.65+7ee	1.90+8ee	2.00+10ee	2.00+10ee	1.90+8ee	2.50+16ee	2.50+16ee	.....	2.05+8ee	2.05+8ee

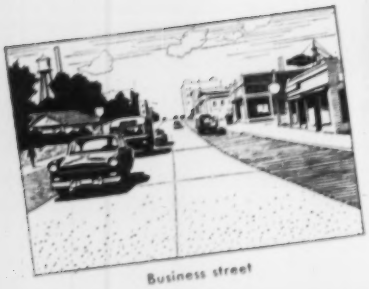
*a 5¢ hr HWF *b lower rates, straight time, other broken *c 2-axle; 10-wheel $2.25; Euclid $2.45 *d intermediate *e bldg constr; highway $2.55 + 7¢ WF *f less than 2-t *g blade *h scoop, bldg *i scoop, road *j plus $2 pd by employer for hosp. death benefits to family *k bldg constr; steel constr $3.475 *l higher rates are union, other taken from min wage scale approved by County Commissioners Court *m 10¢ H&WF *n flatbed *o under 10 cy *p over 10 cy *q over 50 hp *r blade grader *s form and subgrade *t single *u 7½¢ HWF *v up to 6 cy *w 6-8 cy *x cat oper *y up to 3½ cy *z 3½ cy & over *aa plus approx $5.30 per wk W&PF *bb 3% WF, 2% PF, 11 PH *cc 4% WF & 4% PF *dd up to 5 cy *ee 5 cy & over *ff over 1½ T but not over 3 *gg up to 5 tons *hh excavating *ii 4% VP *jj 12¢ H, W & PF *kk 7½¢ WF included in base pay *ll 8% fringe benefits *mm 10¢ H & WF, 10¢ insurance *nn 8 cy or less; 8-16 cy $2.90; 16-25 cy $3.15 *oo Plus $2.25/wk WF *pp 2.5 T $1.70 *rr 12¢ WF *ss 5% WF.

MEXICO CITY PRICES

In Pesos, F.o.b. City		Apr. '56	May '56
Common Wages—Building (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Common Wages—Heavy Const. (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Skilled Labor Wages			
Carpenters (8 hr. day) 1 cl.	av. per hr.	2.46	2.46
Bricklayers (8 hr. day) 1 cl.	av. per hr.	2.46	2.46
Struct. Iron Workers (8 hr. day)..... Remachadores.	av. per hr.	3.77	3.77

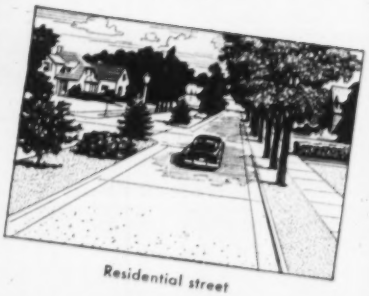
Struct. Steel, Shapes		Apr. '56	May '56
3"-15" x 12 meters.....	per metric ton	1564.34#	1564.34#
# fob Monterrey			
Reinf. Steel, Corr. Rods			
¼" x 11 meters.....	per ton	1865.00	1865.00
⅜" x 11 meters.....	per ton	1865.00	1865.00
½" x 11 meters.....	per ton	1865.00	1865.00
⅝" x 11 meters.....	per ton	1865.00	1865.00
¾" x 11 meters.....	per ton	1865.00	1865.00
1" x 11 meters.....	per ton	1865.00	1865.00

Gravel truck load of 3½ cu. meters		Apr. '56	May '56
Blue Gravel	per tr. load	70.00	70.00
Rose Gravel	per tr. load	65.00	65.00
Cement, Std. Port. (Tolteca)	per ton	230.00	230.00
Lumber			
3rd. Class Pine	per M ft.	1900.00	1900.00
1st. Class Pine	per M ft.	2750.00	2750.00
2nd Class Pine	per M ft.	2300.00	2300.00



Business street

Residential street



Residential street

Fred Wedemeyer, Deputy Director of the Sheboygan Department of Public Works (left) and Robert E. Fleischer, Director of the Department of Public Works placing plaque commemorating the 1,500,000 sq. yd. of concrete streets in the new pavement on 27th Street.

20-year Record in Sheboygan, Wis. Proves Concrete Streets Have Lowest Maintenance

Sheboygan, Wis. paved its first street with concrete in 1911. That street is still in service, still in good condition. Each year since then Sheboygan has added to its concrete street mileage. Today, two-thirds of the city's street mileage is concrete, totaling 76 miles or 1,500,000 sq. yds. of concrete.

Of particular significance is that all the concrete pavement ever built in Sheboygan is still on the job. Not a single block of it has been reconstructed, replaced or resurfaced.

Sheboygan has kept accurate records and therefore has positive proof that maintenance costs are lower on concrete streets. Latest available Sheboygan street maintenance records, spanning a 20-year period, show that concrete pavement cost an average of $105.62 per mile per year to maintain. Two other principal types of pavement average $603.51 and $856.60 per mile per year to maintain. That's 5.7 and 8.1 times more than for concrete streets!

Sheboygan's experience with *low-maintenance-cost* concrete streets is shared by many cities. In addition, concrete usually costs less to build than any other pavement designed for the same traffic, and it lasts much longer. Moderate first cost, low maintenance cost and long life mean *low annual cost.*

Write today for helpful booklet, *"Design of Concrete Pavements for Municipal Streets".* It's free, but distribution is limited to the U.S. and to Canada.

PORTLAND CEMENT ASSOCIATION
Dept. 8a-17, 33 W. Grand Ave., Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
August 6 Connecticut August 7 Massachusetts
STREETS AND ROADS
August 6 Connecticut August 7 Massachusetts

▲† **New Hampshire**—BA 8/24—U. S. Eng., 150 Causeway St., Boston, Mass., constr. Otter Brook Dam, Keene-Roxbury, CIVENG-19-016-57-4, $2,500,000-$3,000,000. Plans deposit $10, refundable. CD 7/18.

BUILDINGS—LB & CA

▲ **B. Perini & Sons, Inc.**, 73 Montwait Ave., Framingham, Mass., LB $2,114,000, est. $2,000,000. HOSPITAL, RUTLAND, VT. Rutland Hospital, Nichols St., Rutland, V. Bids July 24. CD 7/18.

▲† **John A. Volpe Constr. Co.**, 54 Eastern Ave., Malden, Mass., Mass. CA $2,865,347, est. $2,800,000. Proj. 20-5203. Spec. 5655, ADMISSION TREATMENT BLDG. No. 78 and underground electric sys., Veterans Admin. Hospital, BEDFORD, MASS. Veterans Admin., Munitions Bldg., Wash., D.C. CD 6/28, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
August 7 Maryland August 17 Pennsylvania
August 23 New York
STREETS AND ROADS
August 7 Maryland August 17 Pennsylvania
August 23 New York

▲ **Md., Baltimore**—BA 8/8—City, Bureau Hys., 303 Municipal Bldg., Zone 2, 1st stage, storm water conduits, approx. 2,500 ft. 3-cell, 2-cell and single cell, retaining walls and foundation wall for future exten. of Parcel Post Station, Jones Fall Expressway. $2,225,000. Plans deposit $10. J. E. Greiner & Co., 1106 N. Charles St., Zone 1, engrs. CD 11/9/54.

▲† **Pennsylvania**—BA 8/14—U. S. Eng., 2635 Abbottsford Rd., Phila., dredging Delaware River to Bridesburg, ENG-36-109-57-1, $2,000,000. CD 2/4/44.

▲ **N. Y., Buffalo**—BA 8/22—City, Dpt. P. Wks., Geo. J. Goetz, coms., City Hall, Massachusetts Ave. pumping station. $2,500,000. Plans deposit $100, Nussbaumer, Clark & Velzy, 327 Franklin St., Buffalo, Zone 2, engrs. CD 6/12.

▲† **Pa., Phila.**—BA About 8/27—U. S. Eng., 2635 Abbottsford Rd., Phila., storm drainage sys., Frankfort Arsenal, $3,000,000. Harris Dechant Assoc., 123 S. Broad St., Phila., engrs.-archts. CD 4/16/54, under Public Buildings.

BUILDINGS—BA

▲ **Md., Fort George G. Meade**—HOUSING—BA 8/14—U.S.Eng., 24 St. and Maryland Ave., Baltimore, Zone 18, construct and finance armed services housing proj. 1,000 units, (Capehart), Eng.-18-020-56-30, est. $5,000,000, Extended date, McGaughan & Johnson, 2000 D St. N.W., Wash. 6, D.C., engrs.-archts. CD 5/15.

▲ **Pa., Meadville**—REPAIR SHOPS—BA 8/14—Erie R.R. Co., B. Blowers, ch. engr., Midland Bldg., Cleveland 15, O., general constr., car repair shops $2,-000,000. Plans deposit $25, refundable, Osborne Eng. Co., 7016 Euclid Ave., Cleveland 3, O., engr.

▲ **N. Y., New York**—SCHOOL—BA 8/15—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, (prequalified bidders only) general constr. J. H. S. 117, west side of Second Ave., between E. 108 and 109 Sts. $2,500,000. Plans deposit $30. CD 11/12/54.

▲ **Pa., Wayne**—SCHOOL—BA 8/21—Radnor Twp. School Dist., Wayne, high school, paving, bus garage and athletic field, $2,500,000. Extended date, Barney & Banwell, Girard Trust Bldg., Phila., archts. Lambert McGee & Costello, Inc., 1629 Chestnut St., Phila., engr. CD 7/3.

▲† **D. C., Wash.**—MAXIMUM SECURITY—BA 9/5—General Services Admin., Regional Office Bldg., 7 and D Sts. S. W., maximum security bldg., St. Elizabeths Hospital. Plans deposit $110; adv. ENR 8/2. CD 3/29/55.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton.

N. J.—**Reid Contg. Co.**, Inc., 23 Main St., Woodbridge, N. J., LB $2,897,628 (9 bidders) dual roadway bridges, Rte. 37, Sect. 16, from Mathis Bridge to Seaside Heights, Fed. Projs. F-120 (3) and U-200 (1), Ocean Co.

N. J.—**Franklin Contg Co.**, 12 Central Ave., Newark, N. J., LB $530,474 (3 bidders) intersection revision Rte. 3 at U. S. Rte. 46 and Valley Rd., Little Falls Twp. and City of Clifton. Fed. Proj. U-130 (11) and U-186 (13), Passaic Co. Bids July 24. CD 7/10.

▲ **City, Bureau Hys.**, 303 Municipal Bldg., Baltimore 2, Md., rejected bids Jan. 25, first section Jones Falls Expressway, Guilford Ave. to Howard St., BALTIMORE, MD., LB $1,769,064. Will re-advertise. CD 1/27, under LB.

BUILDINGS—LB & CA

▲ **Friedman Homes, Inc.**, Fair Lawn, N. J. Owner Builds. $4,800,000. 300 HOMES on Rte. 17, MONROE, N. Y. Percy Simon, 362 Cedar Lane, Teaneck, N. J., archt.

▲ **Diesel Constr. Co., Inc.**, 24 W. 58 St., New York 19, N. Y. CA $30,000,000. 25 story OFFICE, 60 Broad St., NEW YORK, N. Y. Moses Ginsberg, 24 Sickles St., New York 34, N. Y. Sylvan Bien, 33 W. 46 St., New York 36, N. Y., archt.

▲ **Turner Constr. Co.**, 1500 Walnut St., Phila., Pa. CA $1,800,000. 11 story, bsmnt., 270x49 ft., 7x58 ft., brick veneer, rein.-con. APARTMENT, 165 units, ROCHESTER, N. Y. Owner, c/o contractor, Milton Schwartz, 10 S. 8 St., Phila., Pa., archt. Bloom & Dorfman, 1411 Walnut St., Phila., Pa., engrs.

▲ **Brown & Matthews, Inc.**, 404 4th Ave., New York, N. Y. CA, $5,000,000. design and construct 250-acre INDUSTRIAL PARK, Central-Morris Industrial Park adjacent to railroads' tracks in Danville-Rockway, DENVILLE, N. J. Jersey Central Railroad, Central R.R. of New Jersey, S. L. Mapesk, ch. engr., Jersey City Terminal, Jersey City 2, N. J.

▲ **Seventh Corp.**, 551 Howe Rd., Merion, Pa. CA $3,000,000. SHOPPING CENTER, 15 stores, supermarket, medical center, department store, Lane Apartments 186 units, Tanglewood St., BRIDGEPORT, PA. Valley Forge Center, Inc., c/o Dolph W. Zink, 1528 Walnut St., Phila., Pa. David Freeman, c/o Heritage Co., Bridgeport, Pa., engr.-archt.

▲ **Wynnewood Constr. Co.**, 370 Montgomery Ave., Merion, Pa. Separate Contracts. $3,250,0[illegible]. RESIDENTIAL DEVELOPMENT, Bustleton and Hoffnagle Sts., PHILA., PA.

▲ **Levitt & Sons**, Levittown, Pa. Separate Contracts. Est. $15,000,000. RESIDENTIAL DEVELOPMENT, 580 units, Conestoga Rd., ROSEMONT, PA.

▲ **Joseph R. Farrell, Inc.**, 442 Market St., Phila., Pa. CA $4,000,000. 650,000 sq. ft. DEPARTMENT STORE, 4 level parketeria, UPPER DARBY, PA. John McClatchy Corp., 69 and Market Sts., Upper Darby, Pa. Lathrop Douglass, 518 Fifth Ave., New York, N. Y., archts. Allabach & Rennis, 16 S. Broad St., Phila., engrs. CD 6/13, under CA.

▲ **Mark Slass**, Box 8, Fort Washington, Pa. Separate Contracts. $5,104,000. RESIDENTIAL DEVELOPMENT, 232 units, Rte. 63, FORT WASHINGTON, PA.

▲ **Siesel Constr. Co.**, 3500 Forbes St., Pittsburgh, Pa. CA $2,394,000. 7 story, 2 sub-bsmnt., 134x228 ft., brick, concrete, steel L-shaped general HOSPITAL, MCKEESPORT, PA. McKeesport Hospital, 1400 Fifth Ave., McKeesport, Pa. CD 6/26, under LB.

▲ **L. F. Driscoll**, 18 W. Chelten Ave., Phila., Pa. CA Est. $2,300,000. 6 story, bsmnt., 46x195 ft., brick, concrete HOSPITAL wing and parking lot, PHILA., PA. Episcopal Hospital, Front St. and Lehigh Ave., Phila., Pa. Bids June 11. CD 5/28.

▲ **Community Builders, Inc.**, 8605 Cameron St., Silver Spring, Md. Owner Builds. $5,824,000. 364 HOUSES, Connecticut Ave. and Viers Mill Rd., SILVER SPRING, MD. Jack C. Cohen, 7961 Eastern Ave., Silver Spring, Md., archt.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
August 7 South Carolina August 17 Mississippi
August 22 Louisiana
STREETS AND ROADS
August 7 South Carolina August 8 Virginia

▲† **West Virginia**—BA On Or About 9/13—U. S. Eng., 237 Fourth Ave., Huntington, dam, Sutton Reservoir Proj., Elk River, Braxton Co., Gc ENG-46-[illegible]22-57-4. CD 9/15.

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—Commonwealth of Va., Dpt. Hys., Central Hy. Office Bldg., 1221 E. Broad St., Richmond.
Nello L. Teer Co., Inc., P. O. Box 1131, Durham, N. C., CA, $1,972,350. Hampton approach hy. and structures, Contract B-3, City of Hampton, CD 7/17, under LB. Bids July 11, awarded July 17.

▲ **VIRGINIA**—Commonwealth of Va., Dpt. Hys., Central Hy. Office Bldg., 1221 E. Broad St., Richmond,
E. V. Williams Co., Inc., 1269 E. Princess Anne Rd., Norfolk, Va., **W. H. Scott, Inc.**, Franklin Va. and **Sanford Constr. Co., Inc.**, Sanford, N. C., CA $3,-689,467. Contract B-1B, Hampton approach highway and structures, incl. LaSalle Ave. Exten. Bids June 27. CD 7/2, under LB.

▲ **Atlas Tile & Marble Works, Inc.**, 41-17 Crescent St., Long Island City, N. Y., CA, $2,193,456, Contract C-4A, C-4B and C-4C for tunnel ceiling finish, for tunnel sidewall finish and for paving in tunnel and paving, topsoiling and turfing portals Islands, Hampton Roads Tunnel Proj. VIRGINIA. Commonwealth of Va., Dpt. Hys., Central Hy. Office Bldg., 1221 E. Broad St., Richmond, Va. Bids June 27, awarded July 11. CD 7/2, under LB.

▲ **American Bridge Div., U. S. Steel Corp.**, P. O. Box 2201, Roanoke, Va., CA, $1,724,645. Units II and III, superstructure bridge over Elizabeth River, NORFOLK, VA. Norfolk & Portsmouth Belt Line R. R. Co., C. M. Bell, ch. engr., Union Depot, Norfolk, Va. Bids May 15, awarded July 15. CD 5/18, under LB.

▲† **McDonough Constr. Co.** (Empire Gas Engr. Co., Homestead, Fla.) 7 Baltimore Pl., N. W., Atlanta, Ga. LB, $1,847,000. guided missile control facility No. 2 (WS-107A), San Salvador Auxiliary Air Force Base, NBy 5684, Spec. 5684/56, SAN SALVADOR. Officer in Charge of Constr., Box 956, Coral Gables, Fla. Bids July 20. CD 6/28.

▲ **TENNESSEE**—State Hy. Dpt., Nashville,
Tenn.—**G. & N. Constr. Co.**, McMinnville, Tenn., LB $73,054. concrete deck girder bridge, approaches Bradley's Creek, S-4293 (5), Coffee Co.;
Tenn.—**J. B. Michael Co.**, 1021 Heywood St., Memphis, Tenn., LB $115,322, wid'n. existing bridge and approaches over Manskers Creek, SP-1190-A, Davidson and Sumner Counties;
Tenn.—**W. T. Cutchins Sr.**, Dyersburg, Tenn., LB $111,-099 wid'n. 5 concrete bridges, 2 bridges State Rte. 43; 3 bridges State Rte. 5, SP-1175-B, Gibson and Madison Counties;
Tenn.—**Bethlehem Steel Co.**, Union Trust Bldg., Cincinnati, O., LB $4,344,044. steel superstructure for
(Continued on page 68)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England — **Middle West**
Middle Atlantic — **West of Mississippi**
South — **Far West**

PROPOSED WORK
Water Supply — **Public Buildings**
Sewers, Waste Disposal — **Mass Housing**
Bridges — **Commercial Buildings**
Streets & Roads — **Industrial Buildings**
Earthwork, Waterways — **Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily
For additional reports see Construction Daily.

"New Bonus-Powered International give work-speeding capacity..new

To grade the Indian Hills home project site near Sioux City Country Club, Contractor William C. Grady, LeMars, Iowa, must move 132,000 yards of dry clay—must make cuts 35 feet deep, and fills 25 to 40 feet deep. Two new International 55 Payscrapers, push-loaded by TD-18 crawler, replaced two crawler-scraper units, with these big results:

"The two new 55 Payscrapers have jumped our daily yardage 1500 yards—*80% or better*—compared to crawler-scraper units replaced," reports Owner Grady. "The new 55's have proved that even on very short hauls, their rubber-tired speed pays off. Now, our same

"Years of excellent performance from our International crawler fleet, backed by fine service, helped our company grow to a fleet of 11 International crawlers," states Nor-Vel Construction Co., Ferguson, Mo. Here's two of their TD-24's, helping move wet clay on a large Black Jack, Mo., housing job.

"The new TD-9 has got it—more reserve power that speeds the job," states Owner Gene Elkins, Pontiac, Mich., of his new bonus-powered International crawler—shown doing "clean-up" and grading on a 306-home project near Detroit. "It's really got zip—dozes dirt extra fast in second gear."

"Short-haul yardage soars"

outfits . . . . operating ease"

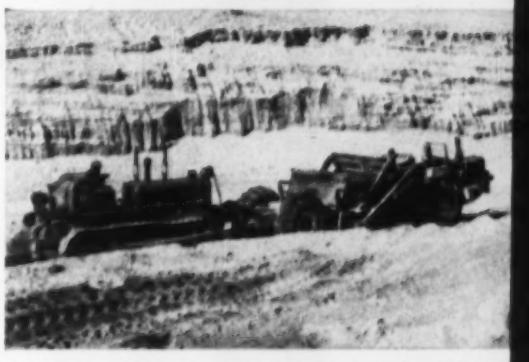
manpower moves practically double our former yardage. Loading averages 42 seconds in dry, hard-packed clay. Easy operation and plenty of power make new Payscrapers the operators' favorites."

Why not try a bonus-powered International outfit on your job? See your nearby distributor for a demonstration!

See you at the ROAD SHOW— CHICAGO Jan. 27 to Feb. 4, 1957

"I can rip up concrete with pry-action breakout—without strain on the crawler," declares J. E. Johnson, Knoxville, Tenn., of his new bonus-powered TD-9 International Drott Skid-Shovel. "Best grading loader I've operated. Has no-strain steering, fine job vision."

4 new TD-24's. "Work ability and distributor service were major factors when buying 4 new TD-24's," says Tony Petitto, Jr., Byron Construction Co., Clarksburg, W. Va. These tractors replaced 4 competitive crawlers. A fifth TD-24 on this stripping job has worked 7500 hours.



"95% International since 1940—"
"Loose, dead sand—almost impossible to load—yet we average 2500 yards daily where I believe other scrapers would fail miserably," reports Contractor N. V. Lamb, Lusk, Wyo. "The powerful International TD-24 Torque Converter and easy-loading 55 Payscrapers are giving high output in tough material."

"Since 1948, preferred International engines"
"With only routine care our International machines stand up," state Howard and Dorsey Hall, Hall Sand & Gravel, Denver, Colo. Their new TD-14 (142 Series) is shown stockpiling sand. Their International fleet includes a TD-14 Skid-Shovel, four power units!

INTERNATIONAL HARVESTER

INTERNATIONAL Construction Equipment

International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Frame Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

(Continued from page 65)

Tennessee River Bridge at Chattanooga, U-072-1 (5), Hamilton Co.;

Tenn.—**Forcum-Lannom Inc.**, Dyersburg, Tenn., LB $215,649, overhead and approaches over N.C. and St. L. R.R., U-005-2 (4), Madison Co. Bids July 18. CD 6/27.

BUILDINGS—LB & CA

▲ **S & M Builders**, 4111 N. Miami Ave., Miami, Fla. Owner Builds. $10,000,000. 527 HOMES, Cutler Ridge, MIAMI, FLA. R. J. Schneider, 1234 S. E. 8th Ave., Hialeah, Fla., archt.

▲ **Badger Mfg. Co.**, 230 Bent St., Cambridge, Mass., CA $2,000,000. design and construct zirconium processing PLANT, PENSACOLA, FLA. NRC Metals Corp. (sub. National Research Corp.) 70 Memorial Dr., Cambridge 42, Mass. CD 5/3.

▲ **Daniels Constr. Co. Inc. of Alabama**, 822 7 Ave. S., Birmingham, Ala., **Edenfield Electric, Inc.**, 303 8 Ave. S., Nashville, Tenn., and **Keighin & Hughes of Ohio**, CA, $75,000,000-$80,000,000. ALUMINUM REDUCTION PLANT, LISTERHILL, ALA. Reynolds Metals Co., M. W. Henry, vice-pres., Reynolds Metals Bldg., Richmond, Va. CD 1/13.

▲ **Walter L. Couse & Co. Contractor**, 12740 Lyndon St., Detroit, Mich., CA, $7,000,000. magnesium PLANT, south of SELMA, ALA. Alabama Metallurgical Corp., jointly owned by Brooks & Perkins Inc., 1950 W. Fort St., Detroit, Mich. and Dominion Magnesium Ltd., 320 Bay St., Toronto, Ont.

▲ **Fluor Corp.**, 2500 Atlantic St., Los Angeles, Calif. CA Est. over $4,000,000. design and construct gasoline extraction PLANT, EUNICE, LA. Union Oil & Gas Corp. of La., Shell Bldg., New Orleans, La., and Texas Gas Exploration Corp., Melrose Bldg., Houston, Tex.

▲ **Cargill, Inc.**, Grain Exchange Bldg., Minneapolis, Minn., Separate Contracts. Est. $2,000,000. soybean processing PLANT, on President's Island, MEMPHIS, TENN. CD 4/17.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES

August 7 Wisconsin — August 8 Michigan

STREETS AND ROADS

August 7 Ohio — August 8 Michigan

▲ **Ohio**—NIKE SITES—BA 8/12—U. S. Eng., New Post Office Bldg., Pittsburgh, Nike sites 21 and 34, Richmond Heights and Warrensville, Cuyahoga Co. $2,500,000. Extended date. CD 7/12.

BUILDINGS—SLC

▲ **O., Cincinnati**—HOSPITAL—Good Samaritan Hospital, Clifton Ave., soon lets contract, hospital addn. Est. $3,800,000, Total est. $6,000,000. Maguolo & Quick, Temple Bar Bldg., archts.-structural engrs. Harry F. Wilson Assoc., Inc., 4908 Delmar St., St. Louis, Mo., consult. engr. CD 6/28.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus,
The Harry Miller Excavating Co., Inc., Suffield, O. CA $4,209,101, est. $4,510,000. Type T-71 and structures 12.319 mi., U.S.R. 21, Sects. 17.80, 0.00, F-1010 (3), Lawrence Twp., Chippewa Twp. and in Norton Twp., Stark, Summit and Wayne Counties. CD 7/17, under LB.

▲ **ILLINOIS**—State Div. Hys., Centennial Bldg., Springfield,
Arcole Midwest Corp., Evanston, Ill. and **S. J. Groves & Sons**, 1100 W. Reynolds St., Springfield, Ill., CA, $2,025,000. combined bid, test road grading, separations, LaSalle-Ottawa, La Salle Co. CD 7/12, under LB.

▲ **MICHIGAN**—Mackinac Bridge Auth., 608 Prudden Bldg., Lansing,
Johnson-Greene Co. & Louis Garavaglia, 24240 Mound Rd., Center Line, Mich. CA $2,218,193. Contr. 3 Div. A concrete deck and asph. surf. on bridge St. Ignace-Mackinaw City. CD 7/5, under LB.

BUILDINGS—LB & CA

▲ **Cedar Lake Lumber Co.**, Cedar Lake, Ind. Own Forces. $3,000,000. SHOPPING CENTER, houses and paving, Lakeside Dr., CEDAR LAKE, IND.

▲ **K. H. Kettlehut**, Lafayette Loan & Trust Bldg., Lafayette, Ind., CA, $3,748,100, south wing of LIFE SCIENCE BLDG. and SMALL ANIMAL BLDG., CA, $619,700. No. 2 GENERAL SCIENCE BLDG. LAFAYETTE, IND. Trustees of Purdue University, West Lafayette, Ind. Bids June 28. CD 6/15.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES

August 7 Iowa — August 14, 15 Texas

STREETS AND ROADS

August 7 Iowa — August 14, 15 Texas

▲† **N. M., Alamogordo**—FACILITIES—BA 9/12—U. S. Eng., Box 1538, Albuquerque, WS-107A facilities, camera pad, special test track, road access, gravel, road access, paved, control bldg., shop, special equip., repair, Holloman Air Force Base, $1,000,000-$5,000,000.

BUILDINGS—BA

▲ **Colo., Camp Carson**—HOUSING—BA 8/17—U. S. Eng., 1709 Jackson St., Omaha, Neb., construct and finance Capehart permanent family housing. Inv. 25-066-57-9. Bids 3/20, rejected. LB $2,579,000. CD 3/22, under LB.

▲ **Tex., Texarkana**—HOSPITAL—BA 9/9—Wadley Memorial Hospital, Texarkana, 5 story, bsmnt., brick, concrete hospital. $2,600,000. Page, Southerland & Page, 602 West Ave., Austin, archts. B. Segall, Jr., 705 Lamar St., Austin, and Reinheimer & Cox, Texarkana, engrs. CD 2/16/55, under Texarkana Memorial Hospital, as owner.

HEAVY CONSTRUCTION—LB & CA

▲ **TEXAS**—State Hy. Comn., Austin,
Tex.—**Uvalde Constr. Co. & Harry Newton, Inc.**, P. O. Box 10286, Dallas, Tex., LB $2,948,837. c. conc. 1.919 mi. Hy. US 287, Proj. U 3 (10) and U-UG 3 (9) Wichita Co.;
Tex.—**The Jarbet Co.**, Box 5008, Beacon Hill Station, San Antonio, Tex., LB $1,033,695, grading, structures, T. & N.O. R.R. Underpass, foundation course, flex. base, hot mix. b. conc. 11.303 mi. HY US 190, Proj. F 401 (6) and FG 401 (7), Robertson Co.;
Tex.—**M. E. Ruby & H. H. Constr. Co.**, 801 Brown Bldg., Austin, Tex., LB $244,819; grading, structures, base surf. 14.305 mi. Hy. FM 936 and 2310, Proj. R-1191-1-1, R-1191-2 and 4 & R-2173-1-1, Hill and Limestone Counties; LB $115,244. grading, structures, base, surf. 5.589 mi. Hy. FM 908, Proj. R-2087-1-1, Milan Co.; LB $106,372, grading, structures, base, surf. 7.843 mi. Hy. PM-2341 and 2342, Proj. R-2206-1-1 and R-2207-1-1, Burnet Co.;
Tex.—**Austin Contg. Co.**, P. O. Box 1590, Dallas, Tex., LB $89,198, grading, structures, base, surf. 3.503 mi. Hy. FM 227, Proj. R-937-1-7, Houston Co.; LB $116,275, flex. base b. conc. 2.33 mi. Palo Pinto Co.;
Tex.—**Collins Constr. Co. of Texas**, P. O. Box 1192, Austin, Tex., LB $200,282, flex. base, two crs. surf. tr. 2.547 mi. Hy. SH 79, Proj. F-1098 (2), Young Co.;
Tex.—**E. B. Darby & Co. Inc.**, P. O. Box 467, Pharr, Tex., LB $429,574, flex. base b. conc. 8.561 mi. Hy. FM 88, Proj. R-698-3-4, Hidalgo Co.;
Tex.—**H. B. Zachry**, P. O. Box 10188, San Antonio, Tex., LB $403,616, flex. base, two. crs. surf. tr. 4.777 mi. hy. U.S. 62 and 180 Proj. S-149 (10), Culberson Co.;
Tex.—**R. C. Buckner**, P. O. Box 609, Jacksonville, Tex., LB $98,363, grading, structures, base, surf. 5.944 mi. Hy. FM-1643 and 350, Proj. S-1824 (2) and (3), Polk Co.;
Tex.—**J. B. Griffin**, 104 Richmond Dr., Waxahachie, Tex., LB $118,675, grading, structures, base, surf. 5.249 mi. Hy. FM-1492, Proj. R-1451-1-3, Ellis Co.;
Tex.—**Reynolds & Huff**, P. O. Box 88, Tyler, Tex., LB $79,258, grading, structures, base, surf. 5.315 mi. Hy. FM-2267, Proj. R-2152-1-1, Anderson Co.;
Tex.—**R. W. McKinney**, P. O. Box 190, Nacogdoches, Tex., LB $156,793, grading, structures, base, surf. 8.103 mi. Hy. FM-168 and 1553, Proj. C-620-1-7 and R-1488-1-3, Fannin Co.;
Tex.—**Adams Bros.**, P. O. Box 310, Athens, Tex., LB $461,911. grading, structures, Calhoun St. Underpass 8.766 mi. Hy. US 75, Proj. I.In 569 (15) and F-569 (16), Navarro Co.;
Tex.—**C. C. Booth**, P. O. Box 508, Stephenville, Tex., LB $77,820. grading, structures, base and surf. 7 mi. Hy. FM-193 and 265, R-950-5-1 & MC-950-1-12, Dickens Co.;
Tex.—**Gulf Bitulithic Co.**, P. O. Box 2572, Houston, Tex., LB $158,772. b. conc. 5.653 mi. Hy. SH 73 and Spur 214, Proj. C-508-4&5-12&5, Jefferson Co.;
Tex.—**B. G. Brown & Co., T. M. Brown & Sons**, and **J. A. Pruit**, P. O. Box 1919, Abilene, Tex., LB $93,237. grading, structures, base, surf. 8.257 mi. Hy. FM-129, Proj. R-22226-1-1, Schleicher Co.
Tex.—**Horton & Horton, Inc.**, 621 N. Live Oak St., Houston, Tex., LB $461,500. furnishing, stockpiling washed shell Hy. SH 73, Proj. B 20-A-3, Chambers Co.;
Tex.—**Kerr & Middleton**, Box 5065, N. College Sta. Lubbock, Tex., LB $109,923. flex. base, 3 crs. surf. tr. 1.399 mi. Hy. SH 86 Proj. S-719 (7), Swisher Co.;
Tex.—**A. L. Sheppard**, P. O. Box 1871, Vernon, Tex., LB $98,142. grading, structures, base, surf. 7.321 mi. Hy. FM 1740, Proj. R 1615-2-2, Clay Co.;
received no bids July 18, grading, structures, base and surf. 4.93 mi. Hy. FM 63, Proj. S 38(7) Newton Co. Bids July 18. CD 6/28.

▲ **City Constructors**, (McLaughlin, Inc., Ford Bldg.; S. Birch & Sons Constr. Co., Ford Bldg.; S. Birch, Inc., Ford Bldg., and Nilson-Smith Constr. Co., 800 2 St. S.), Great Falls, Mont. CA $4,715,851. street imprvs., GREAT FALLS, MONT. City, Great Falls, Mont. CD 7/3, under LB.

BUILDINGS—LB & CA

▲ **O. A. Stocke & Co.**, 115 Southwest Third St., Rochester, Minn. CA $3,069,000 (5 bidders) general constr. SENIOR HIGH SCHOOL, ROCHESTER, MINN. Bd. Educ., R. W. Dorsett, bus. mgr., Rochester, Minn. CD 7/3, under LB.

▲ **Jack H. Cys Constr. Co.**, 1745 Federal Blvd., Denver, Colo., LB Est. Approx. $3,500,000. 8 story HOTEL, parking facilities on main floor and bsmnt., 8th floor to incl. rooftop swimming and dining room, BOULDER, COLO. Boulder Acceptance Corp., (Allen J. Lefferdink) Boulder, Colo. James M. Hunter, 2049 Broadway, Boulder, Colo., engr.-archt.

▲† **Mountain States Constr. Co.**, Azores Constr. Co. & **Everett S. M. Brunzell Corp.**, 9200 W. Colfax St., Lakewood, Colo., LB $3,835,958. six E. M. BARRACKS, ENG-25-066-57-95. CAMP CARSON, COLO. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids July 20. CD 7/13.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES

August 15 California
August 15, 16 California

BUILDINGS—BA

▲ **Calif., Eldridge**—WARD—BA 8/28—State Div. Architecture, 1120 N St. Sacramento, 4 ward buildings, lump sum basis or segrated between general work, electrical work and mechanical work with mechanical broken down between heating and ventilating, plumbing, sewer and water services, at Sonoma State Hospital, Dpt.: Mental Hygiene, $3,000,000. Plans deposit $100.

HEAVY CONSTRUCTION—LB & CA

▲ **Arundel Corp.**, Pier 2, Pratt St., Baltimore, Md., **L. E. Dixon Co.**, 18404 Sherman Way, Reseda, Calif., **The Hunkin-Conkey Constr. Co.**, 1740 E. 12 St., Cleveland, O., and **American Pipe & Constr. Co.**, 4635 Firestone St., South Gate, Calif., LB $12,038,091. first unit of Rocky Beach Dam on Columbia River north of Wenatchee, WASHINGTON. Chelan County Public Utility District, 327 N. Wenatchee Ave., Wenatchee, Wash. Bids July 18. CD 6/20.

▲† **Slate-Hall-Hamilton**, 7805 S. W. 40 Ave., Portland, Ore. LB $4,074,510, est. $3,945,219. (3 bidders) relocating second part of Northern Pacific Railway line in Eagle Gorge Dam Proj. area near Kanasket, Inv. 56-68, WASHINGTON. U. S. Eng., 4735 E. Marginal Way, Seattle, Wash. Bids July 24. CD 6/13.

▲ **CALIFORNIA**—State Div. Hys., Sacramento,
Gordon H. Ball & Erickson, Phillips & Weisberg, 300 Camille Ave., Danville, Calif., LB $2,528,993, est. $2,700,000, (8 bidders) 4-lane divided freeway 4.5 mi. at Atwater between Canal Creek and Grove Ave. on Section U.S. 99 realignment, Merced Co. Bids July 18.-CD 6/22.

▲ **M & K Corp.**, 405 Montgomery St., San Francisco, Calif., CA $2,444,830, widen and realign street, Market St. and Portola Dr. from Hattie to Corbett Sts., SAN FRANCISCO, CALIF. City and San Francisco Co. Dpt. P. Wks., City Hall, San Francisco, Calif. Bids July 11, awarded July 19. CD 7/19, under LB.

BUILDINGS—LB & CA

▲ **H. S. Wright & Co.**, 414 Pontius St., Seattle, Wash. LB $2,855,077. (5 bidders) general contract three rein.-conc. Southwest Seattle Senior High SCHOOL BLDGS. W. Thistle St. and 27 Ave. S. W., SEATTLE, WASH. School Dist. No. 1, 815 4 Ave. N. Seattle, Wash. Bids July 24. CD 6/27.

▲ **James I. Barnes Constr. Co.**, 1940 Spring St., Redwood City, Calif., CA $2,070,000. GENERAL OFFICE and SERVICE CENTER, SAN BERNARDINO, CALIF. California Electric Power Co., 3771 W. 8 St., Riverside, Calif. Construction in early August. CD 12/14

▲ **Codding Enterprises, Inc.**, 4000 Montgomery Dr., Santa Rosa, Calif., CA, $2,000,000. garden HOTEL "Santa Rosa Inn," SANTA ROSA, CALIF. Garden Development Co., 4000 Montgomery St., Santa Rosa, Calif.

CANADA

HEAVY CONSTRUCTION—BA

▲ **Alberta and Saskatchewan**—GAS PIPE LINE—Bids Asked—Alberta Gas Trunk Line Co. Ltd., 320 9 Ave. W., Calgary, Alta., 34 mi., 547 mi. gas pipe line to link Saskatchewan gate to Bindloss Field. Total est. $47,000,000.

BUILDINGS—BA

▲ **Que., Montreal**—PLANT OFFICE—BA 8/6—Canadian Pratt & Whitney Aircraft Co. Ltd., 150 Lorne Ave., Longueuil, 1 story, 62x262 ft., steel plant office addn. and 1 story, 322 ft. 9 in.x243 ft. 4 in. structural steel factory exten., rail and truck loading docks. Total est. $5,000,000 equipped. Percy Booth, c/o engineers, archt. T. Pringle & Son Ltd., 4795 St. Catherine St. W., engrs. CD 5/10.

N. B., Fredericton—SCHOOL—BA 8/7—Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont., constr. Class 1 19-room standard masonry school with related services, Army Camp, Camp Gatetown. $350,000. Plans deposit $100. Wiggs, Lawton & Walker, 4350 Sherbrooke St. W., Montreal, Que., archts. Wiggs, Walford, Frost & Lindsay, 4350 Sherbrooke St. W., Montreal, Que., engrs.

▲ **Que., Monteral**—RESEARCH—BA 8/22—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., 2 story pulp and paper research bldg., Pointe Claire, $2,250,000, incl. equip. Dobush & Stewart, 4635 Sherbrooke St. W., archts. Pulp & Paper Research Institute of Canada, lessee. CD 7/6.

HEAVY CONSTRUCTION—LB & CA

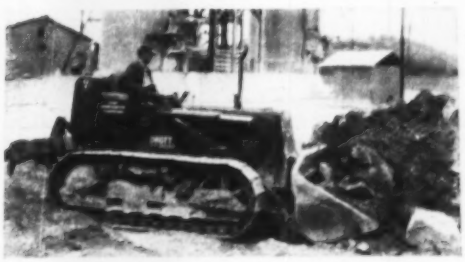
▲ **Majestic Contractors, Ltd.**, Royal Trust Bldg., Edmonton, Alta., CA $2,500,000. laying approx. 100 mi. 34 in. Trans-Canada gas pipe line in Princess Field, ALBERTA. Trans-Canada Pipe Lines, Ltd.,

(Continued on page 70)

"We do '4-hr. jobs' in 2 hrs. with our new TD-9 Skid-Shovel"

—Beatrice Concrete Co.
Beatrice, Nebraska

"Snappiest loader on the market"
Hoosier Lime and Stone Co., Salem, Indiana, added a bonus-powered International Drott TD-9 Skid-Shovel to load crushed stone, level overburden, do custom excavating. "This is the snappiest tractor shovel on today's market," states Operator Lawrence Rutherford. "The new TD-9 Skid-Shovel lifts faster, has more engine power, plenty of operator room and comfort, operates easier, has much better vision."



"Plenty of power . . . perfect vision"
This new TD-9 Skid-Shovel loads 12 to 15 tons of zinc ore from stockpile, every 3 or 4 minutes. Turley and Yates, Rutledge, Tenn., also dig basements, clear and drain land, do custom loading with it. Says Partner Joe E. Yates: "It's fast, easy to operate, has plenty of power, and perfect loading-cycle vision. Hydro-Spring is a life-saver to unit and operator. Roomy seat and handy controls increase output, reduce tiring."

"First thing we noticed about this new International Drott was that it does former '4-hour jobs' in 2 hours," reports Supt. Eldon Chamberlain. "Watching it showed why it doubles production. This new rig fills a bucket easier and faster with pry-action break-out. Operator has better control, watches bucket action more easily—and added hp does top speed work with no strain on machine or operator."

This ready-mix concrete company also excavates and grades—digs basements, backfills, and loads spoil dirt. They recently replaced their older crawler-loader with a new International Drott TD-9 Skid-Shovel.

See how exclusive pry-over-shoe break-out action—now increased to 10,000 lbs. in the International Drott TD-9 Skid-Shovel—gets you the "too-tough-for-others" jobs; helps outproduce 'em anywhere. Prove exclusive, shock-swallowing Hydro-Spring as a cost-cutting yardage-booster. Or, try an exclusive Four-In-One Skid-Shovel—4-machine utility, one moderate investment. Ask for a demonstration!

See you at the ROAD SHOW
CHICAGO
Jan. 28-Feb. 2, 1957

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 8, Wis.

INTERNATIONAL HARVESTER

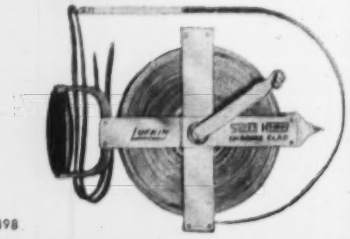
INTERNATIONAL®
DROTT®

WHY SUPER HI-WAY Drag Tapes last longer

LUFKIN

SUPER HI-WAY DRAG TAPE

EASY TO READ MARKINGS THAT ARE DURABLE



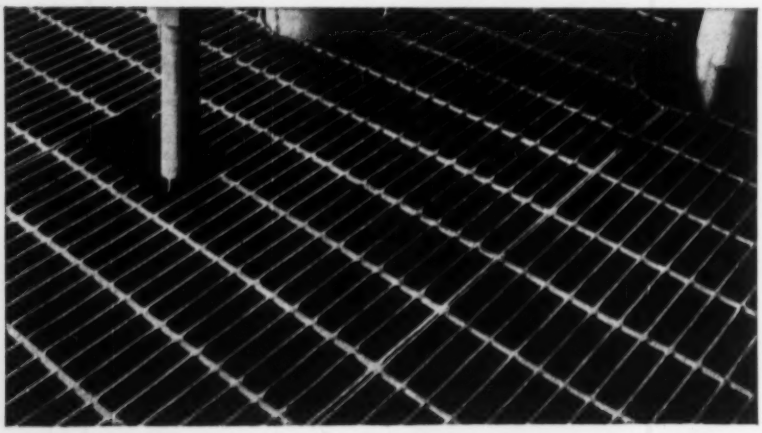
398

Extra heavy tape steel is etched away to leave full strength line with markings raised in bold relief. Raised protective edges and jet black background provide long wear and make markings easy to read. Chrome Clad finish resists rust and corrosion, won't chip, crack or peel. Each foot marked —end feet graduated to 100ths ft. 100 - 200 - 300 foot lengths.

BUY LUFKIN
TAPES • RULES
PRECISION TOOLS
FROM YOUR SUPPLY STORE

THE LUFKIN RULE COMPANY
Saginaw, Michigan

BETTER MEASURE WITH LUFKIN



Gary

WELDED GRATING

Tailor Made to Your Specs

Save installation time and money by having Gary factory-fabricate your open steel flooring needs. For complete description of Gary Gratings, write for Catalog No. E-86

FREE SAMPLE
We'll send this handy paper weight if you request it on your company stationery.

Standard Steel Spring Division
ROCKWELL SPRING AND AXLE CO.
4004 East Seventh Avenue • Gary, Indiana

(Continued from page 68)

505 8th Ave., Calgary, Alta. Awarded July 20. CD 5/29.

▲ ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto, Ont.—McNamara Constr. Co., Ltd., 42 Industrial St., Leaside, Toronto, Ont., LB $2,466,225 (3 bidders) Queen Elizabeth Hy. 2 interchange to N. end of Burlington Bridge and S. end to north end of Beach Rd. Interchange, 2.66 mi. Hamilton;

Ont.—M. Labelle Co. Ltd., 32 3 Ave. P. O. Box 410, Cochrane, Ont., LB, $174,350 (7 bidders) Contract 56-75, gran. base 12 mi. Hy. 11 from 42 mi. west of Hearst easterly. Bids July 4. CD 6/25.

▲ Dominion Bridge Co. Ltd., Lachine, Montreal, Que., CA, $6,808,075, modification of Jacques Cartier Bridge Lachine Section of St. Lawrence Seaway, QUEBEC. St. Lawrence Seaway Auth., No. 2 Temporary Bldg., Ottawa, Ont. Awarded July 16. CD 7/12, under LB.

▲ Canit Constr. Ltd., 507 Place d'Armes, Montreal, Que., LB $2,234,856, (3 bidders) third section Molsons Creek collector sewer, MONTREAL, QUE. City, City Hall, Montreal, Que. Bids July 16. CD 7/9.

BUILDINGS—LB & CA

▲ Byers Constr. Co. Ltd., 5675 Western Ave., Montreal, Que., CA Est. $2,500,000. superstructure for bleaching PLANT, Hy. No. 2, CORNWALL, ONT. Howard Smith Paper Mill Ltd., 407 McGill St., Montreal, Que. Awarded July 16. CD 4/22/55.

▲ C. A. Parsons & Co., Newcastle-on-Tyne, England, CA $3,900,000. steam electric POWER PLANT exten., Unwin Ave. near Leslie St., harbor front, TORONTO, ONT. The Hydro-Electric Power Comm. of Ontario, 620 University Ave., Toronto, Ont. Stone & Webster Canada, Ltd., 44 King St. W., Toronto, Ont., engrs. Awarded July 18.

▲ Redfern Constr. Co. Ltd., 36 Toronto St., Toronto, Ont., CA, Total est. $2,500,000. foundation and site works for steel mfg. PLANT, Martingrove Rd., Etobicoke suburban section of TORONTO, ONT. Canadian Steel Corp. Ltd., Ojibway, Ont. Awarded July 16. CD 7/17.

▲ Anglin Norcross Corp. Ltd., 892 Sherbrooke St. W., and Atlas Constr. Ltd., 4871 St. Catherines St. W., Montreal, Que., CA, $15,000,000. first stage of 2-stage ALUMINUM SMELTER (owner furnishes equip. and some materials), BAIE COMEAU, QUE. Canadian British Aluminum Co. Ltd., 1980 Sherbrooke St. W., Montreal, Que. C. D. Howe C/o. Ltd., 1421 Atwater Ave., Montreal, Que., engrs. CD 4/30.

ALASKA

BUILDINGS—LB & CA

▲ Howard S. Wright & Co., Inc., 414 Pontius St., Seattle, Wash., CA, Est. $2,000,000. PULP MILL addn., KETCHIKAN, ALASKA. Ketchikan Pulp Co., Ketchikan, Alaska.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ VENEZUELA—Ministry of P. Wks., Caracas, Ingenieros Venezolanos, C. A., Centro Profesional del Este, Piso 8, Caracas, D. F., Venezuela and Constructora Acero, S. A., Edificio Polar, Piso 12, Plaza Venezuela, Caracas, D. F., Venezuela, LB $6,268,691 6-mi. stretch of hy. incl. clover leaf near La Encrucijada, 60 mi. west of Caracas; LB $6,882,723, 5.8 mi. adjoining in section of hy. incl. cloverleafs at Tapatapa and Palo Negro Pan-American Hy. CD 5/8.

▲ Ministerior de Obras Publicas, Edificio La Previsora, Caracas, D. F., Venezuela, rejected bids June 30, dredging at drydock and shipyard, PUERTO CABELLO, VENEZUELA. LB $8,038,734. CD 5/24.

PROPOSED PROJECTS

WATER SUPPLY

▲ Conn., New Britain—City, filtration plant, to handle increased load of 30 in. pipe line planned, Burlington, $1,000,000; 30 in. pipeline from Burlington to New Britain, Burlington, Farmington, and New Britain, $1,500,000; enlargement of reservoir for city water supply, Burlington, $1,500,000. Geo. W. Wood, ch. water engr.

▲ Neb., Omaha—Metropolitan Utilities Dist., 18 and Harney Sts., long range water system expansion, $21,904,000. Burns & McDonnell Eng. Co., 95 and Troost Sts., Kansas City, Mo., consult. engr. J. C. Detweiler, owners' water engr. CD 7/12/56.

SEWERS, WASTE DISPOSAL

▲ Fla., Miami—City, 3332 Pan American Dr., Zone 33, $2,750,000 bond election Sept. 25, storm sewers in various locations; $10,000,000 bond election Sept. 25, sanitary sewers, incl. expanding interceptor lines, pumping station or treatment plant. CD 11/18.

BRIDGES

▲ Conn., Hartford—Hartford Bridge Auth., 284 Sheldon St., Windsor—South Windsor Bridge across Connecticut River, South Windsor and Windsor, $8,000,000; Thomas Worcester, Inc., 65 State St., Hartford, consult. engr.

secondary approach structures for Windsor-South Windsor Bridge at Ellsworth Hy., New Haven R.R. and Main

(Continued on page 72)

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(Continued from page 70)

St. in Windsor, Route 5 in South Windsor, $1,000,000. King & Garvaris, 425 Lexington Ave., New York, N. Y., consult. engrs., Coverdale & Colpitts, 120 Wall St., New York, N. Y. and DeLeuw, Cather & Brill, Inc., 202 E. 44 St., New York, N. Y., engrs., both projects. CD 4/11.

▲ **MINNESOTA**—State Hy. Dpt., 1246 University Ave., St. Paul,

Dakota Co.—bridge over Mississippi River between South St. Paul and Newport on T.H. 100. $2,000,000. Bids in December.

STREETS AND ROADS

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford.

Bloomfield and Windsor—lay-out of McGrath Blvd. in part relocation of Route 2 18 (Cottage Grove Rd.) $500,000.

Colchester and Marlborough—relocation of Route 2, $5,000,000.

New Haven—Oak St. connector between Conn. Turnpike and New Haven Center. $500,000.

▲ **Fla., Miami**—City, 3332 Pan American Dr., Zone 33, $5,000,000 bond election Sept. 25, residential streets imprvs. CD 11/18.

▲ **O., Youngstown**—City, City Hall, $8,800,000. bond election Nov. 6 for southerly section of arterial freeway. Robert J. Schorner, 5341 old Oxford lane, consult. engr. CD 11/6/53.

▲ **Tex., Texarkana**—City, street improvements, paving, $3,849,000.

EARTHWORK, WATERWAYS

▲† **Oregon**—U. S. Eng., Pittock Block, Portland, Cougar Reservoir, South Fork McKenzie River, Total est. $38,000,000 ($1,500,000 appropriated).

▲ **Texas**—Neches River Conservation Dist., c/o Gus Whiteman & W. R. Baumier, Lufkin, water conservation dam project, between Zavalla and Broaddus, on Angelina River. $25,000,000. Lockwood, Andrews & Newman, Union Natl. Bank Bldg., Houston, consult. engrs.

LATIN AMERICA

▲ **Panama, Colon**—REFINERY—Petrochemical Co., Eugene du Pont, III and John Shaheen, 420 Lexington Ave., New York, N. Y., refinery. $33,000,000.

AMERICANS ABROAD

▲ **Eire**—REFINERY—California-Texas Oil Co. Ltd., 380 Madison Ave., New York, N. Y., U.S.A., Esso Petroleum Co., 15 W. 51 St., New York, N. Y., U.S.A. and British Petroleum (subsidiary of Standard Oil Co. of N. J., 30 Rockefeller Plaza, New York, N. Y., U.S.A.), 32,000 bbl. per day refinery at Whitegate. $33,600,000. Site purchased.

FOREIGN

▲ **Africa**—City of Salisbury, Southern Rhodesia, plans 23 mi. water pipe line with pumping plant and equip. to bring water from Lake McIlwaine Reservoir, $5,800,000.

PUBLIC BUILDINGS

▲ **Calif., Los Angeles**—SCHOOL—Los Angeles Bd. Educ., 1425 S. San Pedro St., plans by Welton, Becket & Assocs., 5657 Wilshire Blvd., 133,000 sq. ft. Henry Clay Junior High School, 122 St. and Western Ave. $2,500,000. CD 4/8/55.

▲ **Calif., Merced and Atwater**—HIGH SCHOOLS—Merced Union High School Dist., c/o secy., Merced, bond election Nov. 6, two high school bldgs. $3,000,000. Walter Wagner & Partners, Thornington Bldg., archts. CD 6/3/49.

▲ **Calif., San Bruno**—SCHOOLS—San Bruno Elementary School Dist., 533 Elm Ave., San Bruno, schools. $5,000,000.

▲ **Fla., Miami**—CITY HALL—City, 3332 Pan American Dr., Zone 33, $3,500,000 bond election Sept. 25, city hall. CD 11/30/53.

▲ **Ind., Decatur**—POWER PLANT—City Council, City Hall, imprv. municipal power plant by either (1) adding second diesel generating plant, $1,000,000 or (2) constr. steam generating plant, $2,500,000.

▲ **Mich., Detroit**—JAIL—Comrs. Wayne Co., City-County Bldg., county jail addn., Beaubien and Clinton Sts. $2,000,000. CD 9/15/744.

▲ **Mich., East Lansing**—EDUCATION—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, plans by Ralph R. Calder, 1212 Kales Bldg., Detroit, Zone 26, college of education bldg., Michigan State University, $4,000,000. CD 12/2/53.

▲ **Mich., Midland**—SCHOOL—City, Bd. Educ., Midland, $3,100,000 bond election Aug. 15, 2 elementary schools; 6 school addns. CD 2/15/55.

▲ **Mich., Oak Park**—SCHOOL—City, Bd. Educ., 22000 Kipling St., James M. Pepper, supt., $2,500,000 bond election Aug. 27, elementary school 10 Mile Rd. and Greenfield St., and Key Elementary School addn. O'Dell, Hewlett & Luckenbach, 950 N. Hunter Bldg., Birmingham, archts. CD 8/24.

▲ **Neb., Lincoln**—HOSPITAL—City, City Hall, defeated $4,500,000 bonds June 26, city hospital or medical center. CD 7/2.

▲ **Nev., Las Vegas**—CONVENTION CENTER—Clark Co., Court House, voted $4,500,000 bonds, Clark County Convention Center. Adrian Wilson & Assocs., 816 W. 5 St., Los Angeles, Calif., archts.

▲ **N. J., Hoboken**—HOUSING—Hoboken Housing Auth., Hoboken, plans by Erwin Gerber, 11 Commerce St., Newark, 158-low-income housing units, adjacent to Andrew Jackson Gardens, at 4 and Harrison Sts. $2,543,527. CD 6/27/50.

▲ **N. J., Newark**—HOUSING—Newark Housing Auth., 57 Sussex St., plans by Kruher & Fava, 11 Hill St., 12,206 family housing development in Central Ward. $18,000,000. Construction in Spring of 1958. CD 2/13/52.

▲ **O., Cincinnati**—SCHOOL—Oak Hill School Dist., 3900 Race Rd., plans by Geo. Schatz & Assoc., 309 Ludlow Ave., 1 story, bsmnt., brick high school, $2,500,000. Bids in 1957.

▲ **O., Willoughby**—HOSPITAL—Comrs. Lake Co. Painesville, plans by Jenks-Deakin, 134 Main St., Painesville, and Green-Smith Assocs., 71 E. Washington St., Painesville, general hospital to serve west end of Lake Co. $4,000,000-$5,000,000.

▲ **Tex., San Antonio**—SCHOOL—San Antonio Independent School Dist., Lavaca and Matagorda Sts., plans by Bartlett Cocke, 3501 Broadway, and Phelps & DeWees & Simmons, bd. archts., 342 W. Woodlawn St. Edison High School, Blanco Rd., Fresno, Beacon and Santa Monica, $2,000,000. CD 5/25/55.

▲ **Tex., San Antonio**—SCHOOL—San Antonio Independent School Dist., Lavaca and Matagorda Sts., plans by Phelps & DeWees & Simmons, 342 W. Woodlawn St. constr. Highlands Junior-Senior High School, on Hi-Lions Park at Elgin and Patti Sts. $2,500,000. CD 7/21/55.

▲ **Wash., Seattle**—CONCERT and CONVENTION HALL, etc.—City, County-City Bldg., Seattle, Zone 4, bond election Nov. 6, 3,500-seat concert and convention hall and 800-seat multi-purpose bldg. for civic center. $7,500,000. CD 4/29/55.

▲ **Ont., Toronto**—PARLIAMENT—Dpt. P. Wks., Parliament Bldgs., exten. Queen's Park East Block of Parliament Bldgs. $4,000,000.

COMMERCIAL BUILDINGS

▲ **Calif., Albany**—MOTEL, etc.—Fred W. Maisel, 2901 Mt. Diablo Blvd., Walnut Creek, plans by Albert Seyranian, & David E. Arnold, 254 Sutter St., San Francisco, 520 unit motel, swimming pool, shops, etc., opposite Golden Gate Field race track. $8,000,000. CD 7/12.

▲ **Conn., West Hartford**—SHOPPING CENTER—Five City Plaza, c/o Frederick U. Conard, Jr., 15 Lewis St., Hartford, plans by Abraham H. Salkowitz, 37-60 82 St., Jackson Heights, N. Y., 2 story, 332,000 sq. ft. shopping center, etc. 31-acre site, Corbins' Corner, $7,000,000. CD 6/29.

▲ **Mich., Detroit**—MARKET—Eastern Market Merchants Assn., Elias Lewis, pres., 1429 Gratiot St., Eastern Market, on 150 acres site. $5,000,000.

▲ **Mo., Bellefontaine Neighbors (St. Louis 15 P. O.)**—SHOPPING CENTER—Bellefontaine Center, Inc., c/o Leo J. Rothbarth, Victor Packman & Assoc., 9567 Bellefontaine Rd., St. Louis, Zone 15, plans by Murphy & Mackey, 4746 McPherson Ave., St. Louis, Zone 8, suburban shopping center on 40 acres site Hy. 67 at Chambers Rd. to incl. major department store, quarters for 70 other shops and services, 7 story office, sky-line restaurant, medical clinic $10,000,000.

▲ **Mo., Fort Leonard Wood**—HOUSING—Purch. & Contg. Office, Fort Leonard Wood, construct and finance 640 addnl. housing units (Capehart), $7,000,000. CD 5/8.

▲ **Mo., North Kansas City**—HOMES—James H. Stanton Constr. Co., 1012 Baltimore Ave., Kansas City, Mo., 2,500 home sites on 800 acre site, approx. $27,000,000; country club and swimming pool, $500,000; shopping center, $20,000,000, development to be called River Forest Homes, Total est. cost $52,000,000. Hare & Hare, 114 W. 10 St., Kansas City, Mo., landscape archts.

▲ **N. J., Trenton**—HOSPITAL—Mercer Hospital, 446 Bellvue Ave., plans by Skidmore, Owings & Merrill, 575 Madison Ave., New York, N. Y., 8 story, brick cinder block, steel hospital addn. $3,000,000. Seelye, Stevenson, Value & Knecht, 101 Park Ave., New York, N. Y., consult. engrs. CD 7/22/54.

▲ **N. Y., Far Rockaway**—SHOPPING CENTER—Long Island R. R., Aikman Jr., ch. engr., Jamaica Station, Jamaica, Zone 35, and Bailey & Bailey, 1 West Park Ave., Long Beach, shopping center, railroad station on tract between Mott and Nameoke Aves., $2,000,000.

▲ **N. Y., Kingston**—HOUSES, etc.—Whittier Homes, c/o Irwin Jalonack, at site, Kingston, plans by Herman H. York, 90-04 161 St., Jamaica, 4,000 houses, community center, shopping center, schools, churches, on 1,500 acre tract in Ulster and Saugerties Twps., between Rte. 32 and Hudson River. $60,000,000, Leo Novick, 150 E. 35 St., New York, Zone 16, engr. Ten year continuing program.

▲ **O., Cincinnati**—SHOPPING CENTER—Kopf & Kopf, 825 Delta Ave., 1 story, brick, rein.-con. shopping center, incl 20 to 35 stores, North Bend and West Fork Rds. $4,000,000, Jack Markham, 825 Delta Ave., owner's engr.

▲ **O., Cincinnati**—SHOPPING CENTER—North Hills Dev. Co., 22 W. 7 St., plans by Chas. Bradbury, 80 W. 40 St., New York, N. Y., 1 story, 40 store, approx. 200,000 sq. ft., rein.-con., brick shopping center and 2,500 parking area, Galbraith Rd. and Hamilton Ave., North College Hill. $3,500,000. Harold Kling, c/o owner, engr.

▲ **O., Cincinnati**—HOTEL—Rudy Reinhold, 1010 Gilbert Ave., plans by A. J. Martina, 2167 Florence Ave., 5 story, 180,000 sq. ft. hotel, Reading Rd. $3,000,000.

▲ **Tex., Beaumont**—SHOPPING CENTER—Gulfgate Shopping City, c/o Theo. W. Berensen & Assocs., Bankers Mortgage Bldg., Houston, plans by Irving R. Klein & Assocs., 1317 Austin St., Houston, shopping center. $3,500,000. CD 6/1.

▲ **Tex., Houston**—SKYSCRAPER—Interstate Life Insurance Co., 4060 Main St., 21 story skyscraper. $5,000,000; auto parking facilities, $360,000, Travis and Clay Sts.

▲ **Tex., San Antonio**—HOSPITAL—Baptist Memorial Hospital, 111 Dallas St., plans by Bartlett Cocke, 3501 Broadway, 300 hospital bed addn. $4,500,000. CD 12/23.

▲ **Ont., Toronto**—HOUSING—St. Andrew's Estates & Golf Club, Ltd., Old Yonge St., 595 housing units; 400 apartment units, 230-acre St. Andrews Golf Course. $15,000,000. Dr. E. G. Faludi, 614 Church St., planning consult.

▲ **Que., Montreal**—OFFICE—Leo Kolber, 132 St. James St. W., plans by Reuben Fisher, 3177 St. Sulpice Rd., 15 story, steel frame office, Guy and Dorchester Sts. $5,000,000. CD 2/27.

INDUSTRIAL BUILDINGS

▲ **Calif., Los Angeles**—PLANT—Gladding McBean & Co., 290 Los Feliz St., plans by Holmes & Narver, archts.-consult. engrs., 751 S. Figueroa St., 200,000 sq. ft. plant to mfg. vitrified clay sewer pipe, incl. 600 ft. long tunnel kiln. $5,000,000.

▲ **Calif., Stockton**—CANNERY—California Packing Corp., 1000 E. Hazeltine St., 1 story, 800,000 sq. ft., steel, concrete cannery, $2,500,000.

▲ **Conn., Danbury**—FACTORY—Eagle Pencil Co., 703 E. 13 St., New York, N. Y., 1 story factory for mfr. pencils, Newtown Rd., Beaver Brook. $2,000,000.

▲ **Ga., Atlanta**—WAREHOUSE—General Motors Corp., General Motors Bldg., Detroit, Mich., plans by Smith-Hinchman & Grylls, Inc., 800 Marquette Bldg., Detroit, Mich., 1 story, steel, brick aluminum warehouse for Chevrolet Div., Doraville, $2,000,000-3,000,000, Steel awarded to International Steel Co., Inc., 1321 Edgar St., Evansville, Ind. CD 10/26.

▲ **La., Baton Rouge**—PLANT—Wyandotte Chemicals Corp., Alkali Square, Wyandotte, Mich., plant to mfg. ethylene oxide on 700 acres, near here, $8,000,000.

▲ **Mich., Detroit**—FOOD WAREHOUSE AND DISTRIBUTION CENTER—A & P Food Stores, Frank H. Boucher, vice pres., 5470 Hecla St., food warehouse and distribution center, 25 acre site, Fullerton and Schaefer Sts. $5,000,000.

▲ **N. J., Lawrence Twp. (Trenton P.O.)**—PLANT—Newark Evening News, 215 Market St., Newark, 50,000 ton paper pulp plant. $5,000,000.

▲ **O., Lorain**—ASSEMBLY PLANT—Ford Motor Co., The American Rd., Dearborn, Mich., 1,500,000 sq. ft. car and truck assembly plant, 250-acre site, approx. 3½ mi. west of here. $50,000,000.

▲ **Okla., Tulsa**—ENGINEERING—Douglas Aircraft Co., Inc., 2000 N. Memorial Dr., plans by Skidmore, Owings & Merrill, archts.-engrs., 100 W. Monroe St., Chicago, Ill., engineering bldg. for design of C-132, $3,127,050; plaster pattern shop, $200,000. CD 11/15.

▲ **Tex., Daingerfield**—PLANT—Lone Star Steel Co., Daingerfield, and E. B. Germany, 4515 W. Mockingbird Lane, Dallas, 5th open hearth at existing plant, $2,500,000; stretching-reducing mill $1,500,000. CD 1/20/53.

▲ **Tex., Goldsmith**—PLANT—El Paso Natural Gas Co., Bassett Tower, El Paso, gasoline plant. $4,076,000.

▲ **Wash., Bellingham**—REFINERY—The New England Industries Inc., 120 Wall St., New York, N. Y., refinery to produce aviation gasoline. $10,000,000. work may start this year.

▲ **Wash., Mukilteo**—REFINERY—Standard Oil Co. of Calif., 225 Bush St., San Francisco, Calif., refinery with capacity of 50,000 to 60,000 bbl. daily. $75,000,000. Bids 1958. CD 11/7.

▲ **W. Va., St. Albans**—OPERATING CENTER—United Fuel Gas Co. & Affiliated Companies, 1033 Quarrier St., Charleston, constr. Charleston Group Operating Center, 59 acre tract, W. Va. 17, 2 mi. northwest of here. $2,000,000.

▲ **Ont., Simcoe**—PLANT—Canada Wire & Cable Co. Ltd., 147 Laird Dr., Leaside, Toronto, 1 story 200x400 ft. steel frame, brick plant; 1 story, 50x100 ft. steel frame, brick office, 15-acre site. $2,000,000. Babcock Scrivener, Ltd., 119 Isabella St., Toronto, consult. engr. CD 5/23.

▲ **Ont., Toronto**—PLANT—Canadian Steel Corp. Ltd., Ojibway, steel mfg. plant, Martingrove Rd., Etobicoke suburban sect. $2,000,000. Bids in November. Giffels & Vallet of Canada Ltd., 12 Richmond St. E., consult. engr.

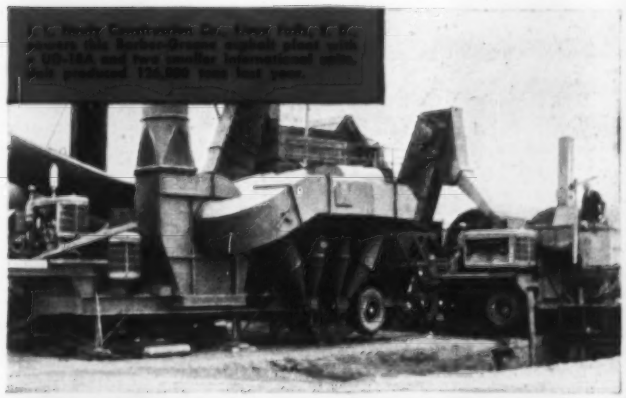
▲ **Que., Chicoutimi**—SMELTER—Eastern Mining & Smelting Corp., 25 Adelaide St. W., Toronto, Ont., nickel smelter and refinery. $27,500,000. Jan H. Reinners, 77 York St., Toronto, Ont., consult. engr. CD 5/14 under Eastern Smelting & Refining Co., as owner.

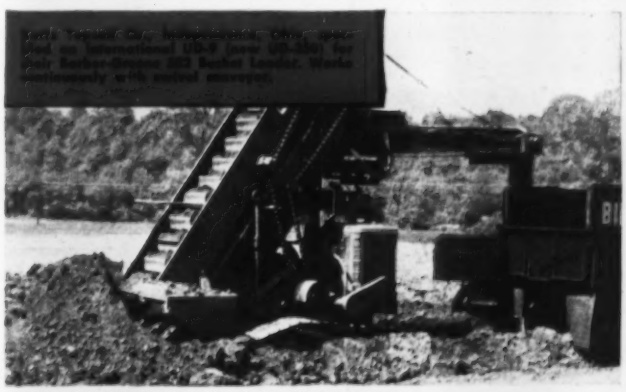
UNCLASSIFIED

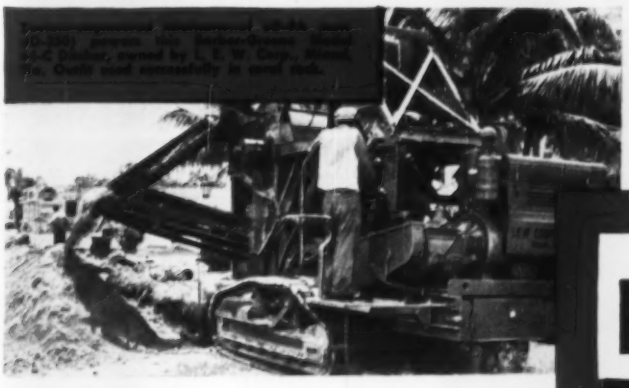
▲ **Md., Baltimore**—PIER—Baltimore & Ohio R.R. Co., K. J. Wagoner, ch. engr., Charles and Baltimore Sts., 1 story, steel, concrete fruit pier south side of Locust Point, Baltimore Harbor. $4,000,000.

▲ **Texas and Missouri**—LOOPING CRUDE LINE—Phillips Pipe Line Co., Bartlesville, Okla., 135 mi. 12 in. looping crude line between Borger, Tex. and St. Louis, Mo. $2,700,000.

(Proposal Advertisement see pp. 79 to 81)







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Equipment	*Load Capacity*	*Maximum Travel Distance*	*Speed*	*Capacity* Per Hour*
POWER-CARTS	9 to 12 cu. ft.	1000 ft.	15 mpr.	15 to 20 cu. yds.
CONCRETE-CARTS	6 to 8 cu. ft.	200 ft.	walking	3 to 5 cu. yds.
WHEELBARROWS	3 to 5 cu. ft.	200 ft.	walking	1 to 1½ cu. yds.

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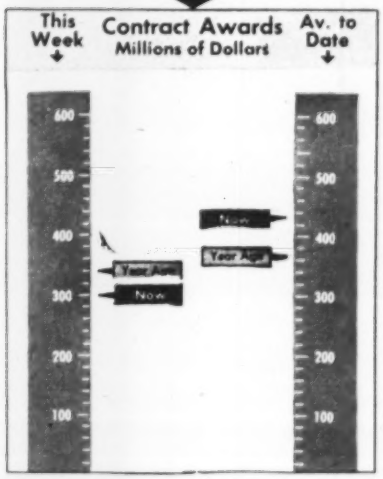
Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 31 wks 1956	Chge %
	$ millions		
Federal	$9.1	$1,115.4	−0.4
State and Municipal	110.1	3,905.3	+23
Total Public	119.2	5,020.7	+17
Total Private	190.3	8,487.5	+19
U. S. Total	$309.5	$13,502.2	+18
By Type of Work			
Waterworks	$9.3	$225.1	+44
Sewerage	8.2	354.3	+53
Bridges	9.1	368.8	+28
Highways	57.4	1,458.6	+14
Earthwork, Waterways	8.1	474.0	+47
Buildings:			
Public, Excl. Housg.	18.7	1,219.4	+15
Public Housing	2.6	216.0	+31
Private Housing	85.5	3,428.8	−13
Commercial	55.3	1,131.8	+7
Industrial	45.4	3,524.7	+114
Unclassified	9.9	1,106.7	−15
U. S. Total	$309.5	$13,502.2	+18

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

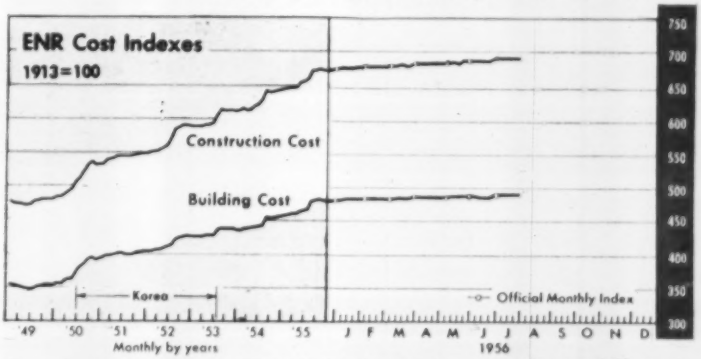
NEW CAPITAL FOR CONSTRUCTION

	Week of July 26	Cum. 30 wks 1956	Chge '55-'56 %
	$ millions		
Corporate Securities	$211.5	$2,693.7	+30
State and Municipal:			
All Except Housing	86.3	2,816.0	+12
Housing	...	42.3	−33
Federal Loans	...	78.5	−2
Federal Aid	...	1,070.0	+44
Total Nonfederal	$297.8	$6,700.5	+22
Federal Appropriations:			
In U. S.	...	$1,118.5	+117
Outside U. S.	...	15.9	−66
Total New Capital	$297.8	$7,834.9	+30

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	Week of July 26 1956	% Change from June 28 1956	% Change from July 28 1955
Construction Cost	696.36	+0.2	+3.6
Building Cost	491.07	+0.4	+2.7

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.845
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518



BUILDING COSTS AND PRICE INDEXES

	May '56 (M) June '56 (J) July '56 (Ju)	Percent Change from Mar. '56 (Mr) April '56 (A) May '56 (M) June '56 (J)	Year ago
Weighted Cost Indexes (1949 = 100)			
ENR Construction Cost†	146 (Ju)	+0.4 (J)	+5.2
ENR Building Cost†	139 (Ju)	+0.1 (J)	+4.6
Associated General Contractors	135 (J)	+1.1 (M)	+5.0
American Appraisal Co.*	129 (J)	+0.5 (M)	+5.0
Marshall & Stevens, Inc.	137 (J)	+1.4 (Mr)	+8.6

† Official monthly indexes for July. * Adjusted for estimated productivity.

Weighted Price Indexes ** **(1949 = 100)**			
E. H. Boeckh & Associates, Inc. Commercial & Manufacturing	133 (J)	+0.4 (M)	+5.7
Smith, Hinchman & Grylls, Inc.	137 (J)	+0.3 (M)	+3.9

** Includes overhead, profit; adjusted for estimated productivity.

Contractor Price Indexes (1949 = 100)			
Aberthaw	135 (J)	+3.8 (M)	+6.1
Austin	129 (J)	+2.4 (Mr)	+9.7
Fruin-Colnon	131 (J)	0 (M)	+3.7
Fuller	126 (Ju)	+0.4 (A)	+3.9
Turner	132 (Ju)	+1.7 (A)	+9.1

HIGHWAY BID PRICE INDEXES

	Second Quarter 1956	Percent Change from Previous Quarter	Year Ago
Quarterly, (1949 = 100)			
California Division of Highways	134.2	+16.6	+20.5
Colorado Department of Highways	100.4	+24.7	+23.3
Idaho State Highway Department	104.4*	−15.8	− 5.2
Oklahoma State Highway Department	107.5	− 2.3	+ 9.1
South Dakota State Highway Dept.	101.4	+16.0	+27.3
Texas Highway Department	114.3	+ 2.0	+ 3.6
Washington State Highway Comm.	103.2	+16.5	+21.0
US Bureau of Public Roads Composite Mile	110.5	+ 2.3	+ 7.8

* Index shown is based on 1950 = 100.

CONSTRUCTION MACHINERY PRICE INDEXES

BLS Indexes of Manufacturer Prices, (1947–49 = 100)	June 1956	Percent Change from Last Month	Year Ago
All Types	146.7	+0.1	+ 8.9
Power Cranes and Shovels	148.7	+0.4	+ 9.6
Tractors	157.8	0	+10.4
Scrapers and Graders	140.6	0	+ 8.1
Mixers and Pavers	134.2	0	+ 5.9
Machinery, Tractor Mounted	142.5	0	+ 5.7
Specialized Construction Machinery	133.8	0	− 8.4
Portable Air Compressors	133.2	0	+ 0.3
Air Tools, Hand Held	150.0	+2.5	+20.0

The strike has been settled but . . .

No Fast End to Steel Shortage

The 27-day steel strike is over. Individual companies rushed to sign new wage pacts with the union this week after reaching an agreement last Friday on a three-year, no-strike contract.

Effects of the strike will be felt in the steel-short construction industry throughout 1956 and well into 1957.

It will require from ten days to three weeks for various steel producers to get steel flowing again at the pre-strike rate. Because of the time required to fill the supply pipeline, some stoppages seem inevitable for construction projects in the next few weeks.

There is also a strong possibility that some awarding agencies will not let construction contracts for major projects until steel delivery can be assured.

• **Price increase coming**—Added to the uncertainties of delivery is the problem of price. Steel producers were agreed even before the strike started on July 1 that a hefty price increase would follow any new wage pact.

On the basis of steel price increases that came in the wake of previous wage settlements, some observers say producers may boost their prices $12 a ton or more this time.

Others feel the increase will be in the neighborhood of $10 a ton. Such an increase would push construction costs to a record high.

One unknown in the price picture is whether the steel companies will go ahead with earlier plans to raise prices to help pay for expansion as well as their higher wage costs.

Present plans call for the addition of 15,000,000 tons of steel capacity in the next few years. Steel producers feel that much of this expansion should be financed out of retained earnings. To build up their retained earnings, they say they would have to raise prices substantially.

• **Wage package costly**—Even without the expansion factor, the steel companies probably will have little difficulty in justifying a $10 to $12 a ton price boost because the new wage agreement with the steelworkers is costly.

In essence, this is what the new contract gives the steelworkers:

• A three-year, no-strike contract.

• pay increases averaging 10.5 cents an hour in the first year and 9.1 cents an hour in each of the next two years.

• Cost-of-living increases (to be computed twice yearly) up to a total of four cents an hour.

• A supplementary unemployment benefits plan that gives workers with two or more years of service layoff pay at the rate of 65% of their take-home pay, for a period of up to 52 weeks.

• A premium for Sunday work. (Traditionally, steelworkers have drawn straight-time pay for Saturday and Sunday work.)

• Increased pension and insurance benefits.

• A seventh paid holiday.

• A higher vacation pay and jury pay.

Also included in the new contract: a union shop requirement.

• **Hellzapoppin'**—Even at a higher price, construction won't get all the steel it needs, according to Eugene G. Grace, chairman of Bethlehem Steel Corp., the nation's second largest steel producer, and the biggest (along with U. S. Steel) producer of structurals.

Grace said last week that demand for steel after the strike would be so intense that "there's going to be hellzapoppin' in the steel industry all the rest of this year."

The Bethlehem chairman added that the scarcest post-strike items would be structural steel, reinforcing bars, plates and oil-country goods. He commented that a considerable number of construction projects already are being held up because of the steel shortage and predicted more delays in construction of highways, schools, industrial buildings and freight cars (which also use structural steel).

This pessimistic forecast of a continued shortage of steel for construction echoes reports made to ENR in recent weeks from various major cities (ENR July 26, p. 98).

Only a few days before the strike ended, many of these cities were expecting imminent job shutdowns. Cleveland, for example, had virtually exhausted its supply of structurals and was short of bars, wire mesh and tie wires.

Similar reports came from St. Louis, Dallas, Denver, Pittsburgh, Seattle and San Francisco. Such southern cities as Atlanta and Birmingham were hit even harder because of the Tennessee Coal & Iron strike which preceded the national steel strike by two months.

Mass Homebuilders Run Into Trouble

Mass homebuilders and developers in two areas ran into some local legislative curbs last week.

Volusia County, Fla., (which includes the city of Daytona Beach), clamped down on real estate developers, said that in the future developers will be required to guarantee adequate roads and drainage facilities by furnishing performance bonds to cover the cost of these improvements.

County commissioners said they took the step to curb wildcat promoters "who print glowing brochures about land that's not fit for alligators."

A more general set of restrictions may be coming up in the Sunshine State. On the agenda for a special session of the Florida legislature is a bill to restrict real estate subdivisions and sale of property for residential purposes.

Trouble for mass homebuilders also developed in the North. The town of New Castle, in Westchester County, N. Y., faced a court fight by speculative builders after passing an ordinance that rations homebuilding permits.

The regulation permits officials to ration permits in districts that have overcrowded schools or other overburdened public facilities. Persons building homes for their own occupancy would get top priority in permits. Local small builders (four to five houses a year) would get second priority; mass homebuilders would come last.

To set up a standard, maximum number of permits issued would be the average over the preceding six-year period. Several builders who had acquired tracts and built a model home were caught by the new ordinance.

While these homebuilders were having trouble with local officials, the biggest homebuilder of them all—Levitt & Sons—was faring better. Levitt persuaded the New Jersey legislature to shuffle three townships in the state to make administration simpler after the firm builds its 15,000-home Levittown, N. J., project.

The change insures that the entire project will be located in one township. The move will avoid some of the problems encountered in Levittown, Pa., which is regulated by ordinances of three townships and one borough in which it is located.

Bond Issue Okayed

Judges uphold $185-million bond sale to finance last leg of Florida turnpike

The Florida State Supreme Court has validated a bond issue of $185 million for a 279-mi extension of the Florida toll turnpike from Fort Pierce to Tisonia, 15 mi north of Jacksonville (ENR July 19, p. 110).

"If the bond market is right," the bonds will be sold in October and the "dirt should be flying" by Nov. 1, according to Thomas B. Manuel, chairman of the Turnpike Authority.

Engineering work had started in anticipation of the favorable court decision, Manuel said. The entire turnpike may be open to traffic within two years, according to the chairman. He expects the 108-mi Miami to Fort Pierce section to be completed by Jan. 1—provided the state can get steel. (As of last week, the spreading steel shortage had already put a crimp in the state's public works program.)

• **One dissenter**—The State Supreme Court's bond validation decision was not unanimous, six judges approved the issue. There was one dissenter, Justice B. K. Roberts, who said the turnpike should terminate at Jacksonville at its northern end. (Instead, it will by-pass the city six miles to the west and will join with U.S. 17 north of Jacksonville.)

Some Jacksonville interests, including some members of the City Traffic Advisory Committee, opposed the bond validation.

State attorney William D. Hopkins, who presented this opposing view to the court, criticized the route selected for the turnpike (it runs through the center of the state, from Fort Pierce northward) and also charged that the Turnpike Act amounted to an unwarranted and improper delegation of legislative authority to the Turnpike Authority.

Hopkins also claimed that the proposed bonds would become an obligation of the State of Florida—in violation of the constitution. (The state constitution forbids any state bond issue, except to repel invasion.)

However, the court ruled that objections to route and terminus were not valid because the general route and terminus were defined by the legislature.

And, the court held that the constitutional question had been decided when bonds were validated for the Miami-Fort Pierce section. (At that time, the court ruled that the bonds are an obligation of the Turnpike Authority, not the state.)

• **Extension needed?**—The last leg of the turnpike came under fire from other quarters. The City Traffic Advisory Committee of Jacksonville appealed to Gov. LeRoy Collins prior to the validation proceedings, urging the abandonment of the turnpike extension. The group said it would not be needed in view of the new federal-aid highway program.

Collins replied that "with the tremendous growth that the State of Florida is now enjoying, and with the federal funds that will be made available to the state under the 1956 Highway Act, there will still not be enough money to build an adequate system for Florida."

Collins also told the group that "Florida is much further behind in meeting our roadbuilding needs than I think most citizens realize. In the use of our state and federal funds, we must make first need come first."

First National Industrial Building Sites Show Set

A five-day exposition opening Nov. 12 at New York's Coliseum may aid industry in the increasingly difficult problem of finding good sites for new plants.

For the first time, industry will be able to find under one roof the information on plant sites available throughout the nation, as well as the advantages cited by states, cities, local municipalities, railroads, utilities and others that are attempting to attract industry.

Admission will be by invitation only. Among those to be invited are industrial executives, engineers, industrial realtors and management consultants.

The show is being sponsored by the National Industrial Development Exposition, Inc., in New York City.

Business Briefs . . .

• **In the swim**—Giving buyers "extras" is a now-familiar story to homebuilders who have had to add built-in ovens, appliances, et. al. Now two New York builders, planning a 96-home split-level development in Long Island's Bar Harbor section, have a new gimmick. They're seriously considering a private swimming pool for each of the $25,000 to $27,000 homes in the development.

• **Recommend new code**—The State Plumbing Laws Commission of Illinois will recommend a minimum plumbing standards code for the state in the near future. Target: allegedly low standards in some of the state's unincorporated areas.

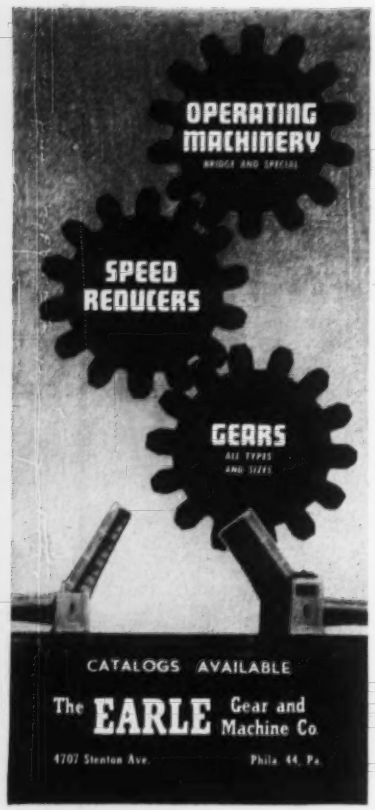
• **Sales record** — National Gypsum Company's sales and earnings for the first half set new records. Sales jumped 13% over the comparable period of 1955, totaling $81.4 million. Profits of $8.9 million showed an increase of 15% over the same period last year.

• **No sale**—A pair of municipal bond issues, totaling more than $7 million, last week illustrated the problems of some smaller borrowers in today's tight money market. Abbeville, La., rejected the only bid received for a $2.7-million utilities revenue issue because of the high cost of borrowing (a net interest cost of 4.22%). And, a similar interest charge caused the Middletown Township School District (N. J.) to ring up "No Sale" on a $4.5-million issue.

• **Steel scrap prices up**—After declining since April (when they reached a peak), steel scrap prices reversed themselves and started up again. Pittsburgh posted a $6 increase; Philadelphia, $3; and Chicago, $5.

• **Housing slump hurts**—The drop in homebuilding helped to chop sales and earnings of American Radiator & Standard Sanitary Corp., during the second quarter. With sales of plumbing fixtures down and costs up, earnings skidded some 30% under the comparable 1955 period. After-tax profits for the second quarter: Just under $3.5 million.

• **Mergers in reverse**—The once merger-minded Louis Wolfson, who turned construction firm Merritt-Chapman & Scott into one of the nation's biggest and best-publicized jack-of-all-trades, last week took another step in the opposite direction. MC&S subsidiary Newport Steel Co. will be sold to Acme Steel Co. Earlier this year, the parent company sold Nesco, Inc. (an appliance maker); Utah Radio Products (manufacturer of radio and TV speakers and cabinets) and Shoup Voting Machine Corp.



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Income Security

Ohio plan wins clearance on jobless benefit issue

An administrative decision on an Ohio private income security plan, somewhat similar in purpose to a savings account plan just won by plumbers in the San Francisco area, rules that employees may receive payments under the plan without prejudicing their right to simultaneous receipt of state unemployment benefits. Ohio had previously ruled that GAW payments under the auto plans must be deducted in computing the amount of state benefits to which a claimant is entitled.

The distinguishing feature between the two plans is that individual employees acquire a "nonforfeitable interest" in the private plan.

The new ruling, from the director of the Ohio Bureau of Unemployment Compensation, relates to a company financed individual income security plan for unemployed workers of Eaton Manufacturing Co., Cleveland. Company contributions at the rate of 3½ cents an hour per employee go into a trust fund in which each employee has an individual account. During a layoff, an employee may draw from his account; on termination of employment, he may withdraw the balance; on death, his estate gets the balance. Maximum accounts for any employee are $600; when the limit is reached, the hourly contributions go into a vacation fund instead.

Details of unemployment and sickness savings accounts for San Francisco plumbers are still to be worked out. Marking labor's growing interest in regularity and security of income, the plumbers' contract calls for a 25-cent hourly savings account contribution by employers commencing next July, if a workable plan can be devised (ENR, July 26, p. 103).

A Big Problem Is Raised By Hod Carriers Strike

Out of a 20-day strike of plastering hod carriers in Sacramento, Calif., has come a building trades problem reminiscent of "salary compression" in the engineering profession.

Hod carriers Local 262 struck to push a demand for a 25-cent hourly pay boost, which would have raised the members' daily pay to $27—20 cents more a day than the pay for the plasterers they tend. Citing their long apprenticeship training and high skills, the plasterers in Local 295 objected to higher pay for the unskilled trade. But the hod carriers hadn't had a raise in two years and remembered that their brothers who tend bricklayers had been given a 25-cent boost.

The basic problem was left for future solution when settlement was reached last week. The new two-year contract grants a 15-cent hourly increase now, with two 10-cent boosts next year.

Construction Wages

Carpenters union finds higher rates justified

To accuse construction workers "of being the main culprit in the cost of construction is plain silly," according to the United Brotherhood of Carpenters and Joiners.

In the July issue of its monthly journal, the union takes a look at building wages and reaches three conclusions: current wage levels are not hurting construction volume; wage rate increases are not out of line with increases in other construction costs and in the price of consumer products generally; and the wage differential enjoyed by construction workers is justified by the nature of the industry.

Starting with the proposition that "price is an important factor in demand," the union cites several things in support of its first conclusion. Home ownership now stands at the highest level in history. The amount of commercial construction erected in the last 20 years is "roughly equal to all the comparable facilities which were in existence in 1936." (Average hourly earnings of construction workers have risen from $1.46 in 1946 to $2.70 today.)

Along with the increase in wages—which the union claims represent "only a small percentage" of total construction costs—have come substantial increases in the costs of land and materials. At the same time, homes—like automobiles—are now designed with more costly "frills and extras."

These parallel trends have been accompanied by an increase in productivity, the carpenters argue, and the net result is that construction workers are "getting no greater share of the construction dollar" and are "barely holding" their own.

According to BLS reports, present hourly earnings of construction workers ($2.70) compares with $1.96 for

production workers in manufacturing. To the carpenters, the differential is justified on several counts: construction workers require a high degree of training, skill and versatility; weather conditions, material shortages and short job durations lend instability to their employment; their basic rates are not as highly supplemented by fringe benefits as are those of workers in many other industries.

Wages and Taxes

Meany sees higher wages and tax cuts necessary

AFL-CIO President George Meany has urged that the national economy be strengthened by wage increases and by federal income tax deduction. His recommendations rest on the concept of a consumer-based economy.

• **Tax program**—In presenting the AFL-CIO $3-billion tax-cut program (ENR July 12, p. 112) to Congressional leaders, Meany urged that immediate tax relief be granted: (1) to low-income and middle-income families by upping personal exemptions from $600 to $700 or by reducing the tax rate on the first $1,000 of taxable income from 20% to 15% and (2) to small corporations by reducing the normal tax to 25% and raising the surtax to 27%.

Such action, he said, is justified for two reasons—it would stimulate the economy which is already showing declines in automobile production, homebuilding and electrical appliances, and it would make the tax structure more equitable.

• **Wage increases**—At the same time, Meany has urged wage and salary increases and fringe benefit improvements as further means of strengthening consumer markets.

In an economic analysis prepared for the PHILADELPHIA INQUIRER, he said that rising capital investment—which means increased production—is not alone the answer to a prosperous economy. "The health of the American economy at present, and in the long run," he warned, "rests on the ability of consumers to buy an increasing volume of goods and services, made available by our improving capacity to produce."

The responsibilty of balancing ability to produce with ability to consume, he noted, rests with both public and private groups.

OFFICIAL PROPOSALS

Bids: August 27, 1956

Storm Sewers for Milk River Drain Wayne and Macomb Counties, Michigan

ADVERTISEMENT FOR

Sealed proposals for furnishing all labor, material and equipment for installing approximately 6,000 lin. ft. of 10 ft. to 16 ft. diameter tunnel sewers together with junction chambers, manholes and appurtenances will be received by the Drainage Board for the Milk River Drain, Wayne and Macomb Counties, Michigan, Christopher J. Mullé, Sec'y, at the office of the City Clerk in the City Hall of Grosse Pointe Woods, Michigan, at or before 2 o'clock P.M. Eastern Standard Time, August 27, 1956, at which time and place the bids will be publicly opened and read. No bid may be withdrawn after scheduled closing time for at least 70 calendar days.

Contract documents including necessary plans may be examined or procured from Christopher J. Mullé, 2523 Cadillac Tower, Detroit, Michigan. A deposit of $25.00 will be required for contract documents and plans necessary for bidding. The entire deposit will be refunded upon return of plans in good condition within twenty days after date bids are received. Bids may be rejected unless made on forms furnished with contract documents.

A certified check or bid bond in the amount of 5% of the bid made payable to the Drainage Board for the Milk River Drain must accompany each proposal. The deposit of the successful bidder shall be forfeited if he fails to execute the contract and bonds within ten days after award.

The Drainage Board reserves the right to reject any or all bids, waive informalities or accept any bid it may deem best.

Drainage Board for Milk River Drain
John Hudson, Chairman
Christopher J. Mullé, Sec'y.

Pate and Hirn
Consulting Engineers
532 Michigan Building
Detroit 26, Michigan

Bids: August 14, 1956

Pennsylvania Turnpike Commission Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:45 a.m., Eastern Daylight Saving Time, the 14th day of August 1956, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 3, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contracts:

Contract No. 437—Valley Forge Interchange, Norristown Interchange, Northeast Connection and Fort Washington Interchange.

Contract No. 437A—Willow Grove Interchange, Philadelphia Interchange and Delaware Valley Interchange.

The projects consist of the construction of curbing and the necessary revisions in drainage. The curbing will generally be constructed on the inside of the Interchange Ramp curves where the radius is 400 feet or less.

Copies of plans, specifications and Contract Documents are on file and open to public inspection on July 27, 1956, at the office of the Pennsylvania Turnpike Commission in Harrisburg, Pennsylvania. Plans, specifications and other contract documents will not be available before this date for mailing to prospective bidders.

Plans and contract documents may be obtained from the Commission upon payment of ten ($10.00) dollars for each set. Each set shall include both Contract No. 437 and Contract No. 437A. Copies of the Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five ($5.00) dollars per copy. No refund will be made for plans or contract documents returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P.O. money order to the Pennsylvania Turnpike Commission and must accompany requests for contract documents and specifications.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
John F. Byrne
Secretary and Treasurer

Harrisburg, Pennsylvania
19 July 1956

Bids: August 27, 1956

Wayne County, Michigan

ADVERTISEMENT FOR
Storm Sewers for Black Marsh Drain

Sealed proposals for furnishing all labor, material and equipment for installing approximately 1900 lin. ft. of 8 ft. to 10 ft. diameter tunnel sewers and 1600 lin. ft. of 3 ft. to 6 ft. diameter open cut sewers together with junction chambers, manholes and appurtenances will be received by the Drainage Board for the Black Marsh Drain, Wayne County, Michigan, Christopher J. Mullé, Chairman, at the office of the City Clerk in the City Hall of Grosse Pointe Woods, Michigan at or before 2 o'clock P.M., Eastern Standard Time, August 27, 1956, at which time and place the bids will be publicly opened and read. No bid may be withdrawn after scheduled closing time for at least 70 calendar days.

Contract documents including necessary plans may be examined or procured from Christopher J. Mullé, 2523 Cadillac Tower, Detroit, Michigan. A deposit of $25.00 will be required for contract documents and plans necessary for bidding. The entire deposit will be refunded only upon return of plans in good condition within twenty days after date bids are received. Bids may be rejected unless made on forms furnished with contract documents.

A certified check or bid bond in the amount of 5% of the bid made payable to the drainage Board for the Black Marsh Drain must accompany each proposal. The deposit of the successful bidder shall be forefeited if he fails to execute the contract and bonds within ten days after award.

The Drainage Board reserves the right to reject any or all bids, waive informalities or accept any bid it may deem best.

Drainage Board for Black Marsh Drain
Christopher J. Mullé,
Chairman

Pate and Hirn,
Consulting Engineers
532 Michigan Building
Detroit 26, Michigan

U. S. Government

Sealed bids for construction (except elevators) of the Maximum Security Building, Saint Elizabeths Hospital, Washington, D. C., will be received until 2:00 PM EDST Sept. 5, 1956 in Rm. 7100 GSA Regional Office Bldg., 7th & D Sts., S.W., Washington, D. C., and then publicly opened in Rm. 7100. Contractors desiring to bid the entire project may obtain 3 sets of bidding material without deposit; 3 additional sets by depositing $110.00 per set from Public Buildings Service, Rm. 1304 GSA Bldg., 19th & F Sts., N.W., Washington 25, D. C. Builders Exchanges, Chamber of Commerces and other organizations may obtain one set for inspection by any interested subcontractor or material firm. Commissioner of Public Buildings, General Services Administration.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 1-C-1736) will be received at Ephrata, Washington, until September 6, 1956, for furnishing labor and materials for Earthwork, Concrete Lining, and Structures, Block 2, Burbank Canal Laterals, Columbia Basin Project, Washington. Location southeast of Pasco, Washington. Principal items are 221,000 cu. yds. excavation; 3,000 cu. yds. concrete in lining and structures; 2,200 lin. ft. concrete pipe, 6- to 48-inch; 3,000 pounds metalwork; and other work. Completion time 350 days. For particulars, address Bureau of Reclamation, P.O. Box 368, Ephrata, Washington; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: August 14, 1956

Pennsylvania Turnpike Commission Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:30 a. m., Eastern Daylight Saving Time, the 14th day of August 1956, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 3, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contracts:

Contract No. 251—Carlisle Interchange, Gettysburg Pike Interchange, Harrisburg West Shore Interchange and Harrisburg East Interchange.

Contract No. 251A—Lebanon-Lancaster Interchange, Reading Interchange and Morgantown Interchange.

The projects consist of the construction of curbing and the necessary revisions in drainage. The curbing will generally be constructed on the inside of the Interchange Ramp curves where the radius is 400 feet or less.

Copies of plans, specifications and Contract Documents are on file and open to public inspection on July 27, 1956, at the office of the Pennsylvania Turnpike Commission in Harrisburg, Pennsylvania. Plans, specifications and other contract documents will not be available before this date for mailing to prospective bidders.

Plans and contract documents may be obtained from the Commission upon payment of ten ($10.00) dollars for each set. Each set shall include both Contract No. 251 and Contract No. 251A. Copies of the Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five ($5.00) dollars per copy. No refund will be made for plans or contract documents returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P. O. money order to the Pennsylvania Turnpike Commission and must accompany requests for contract documents and specifications.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
John F. Byrne
Secretary and Treasurer

Harrisburg, Pennsylvania
19 July 1956

Bids: August 9, 1956

Walt Whitman Bridge Contract No. 9

DELAWARE RIVER PORT AUTHORITY
of the
COMMONWEALTH OF PENNSYLVANIA
and the
STATE OF NEW JERSEY
Administration Building
Camden, New Jersey

Sealed bids will be received for "Asphaltic Concrete Pavement on Structures between the west abutment at Front Street in Philadelphia, Pa., and the abutments in the vicinity of the North-South Freeway in Gloucester, N. J.," known as Contract No. 9, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M. Eastern Daylight Time, Thursday, August 9, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of $10.00 check, which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $20,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

Bids: August 14, 1956

Pennsylvania Turnpike Commission Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 a. m., Eastern Daylight Saving Time, the 14th day of August 1956, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 3, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contracts:

Contract No. 574 —Lansdale Interchange
Contract No. 574A—Quakertown Interchange
Contract No. 574B—Lehigh Valley Interchange
Contract No. 574C—Pocono Interchange
Contract No. 574-A-B-C—Lansdale, Quakertown, Lehigh Valley and Pocono Interchange

The projects consists of the construction of curbing and the necessary revisions in drainage. The curbing will generally be constructed on the inside of the Interchange Ramp curves where the radius is 400 feet or less.

Copies of plans, specifications and Contract Documents are on file and open to public inspection on July 27, 1956, at the office of the Pennsylvania Turnpike Commission in Harrisburg, Pennsylvania. Plans, specifications and other contract documents will not be available before this date for mailing to prospective bidders.

Plans and contract documents may be obtained from the Commission upon payment of ten ($10.00) dollars for each set. Each set shall include Contract No. 574 to Contract No. 574C. Copies of the Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five ($5.00) dollars per copy. No refund will be made for plans or contract documents returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P. O. money order to the Pennsylvania Turnpike Commission and must accompany requests for contract documents and specifications.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
John F. Byrne
Secretary and Treasurer

Harrisburg, Pennsylvania
19 July 1956

Bids: August 9, 1956

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A. M., Eastern Daylight Saving Time, on August 9, 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 5 MATTYDALE TO JEFFERSON COUNTY LINE, TOWNSHIPS OF CICERO, HASTINGS, PARISH, RICHLAND & SANDY CREEK, ONONDAGA AND OSWEGO COUNTIES, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-93

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Wm. Robinson, District Engineer, 301 East Water Street, Syracuse, New York.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $35,050.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1800.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

Bids: August 24, 1956

Contract EXD-130.026

THE PORT OF NEW YORK AUTHORITY
PORT AUTHORITY BUILDING
NINTH FLOOR (SOUTH) ALTERATIONS

Sealed proposals for alterations on the south side of the ninth floor of the Port Authority Building between column lines 1 and 13, together with modifications to the sprinkler, plumbing, heating, ventilating air conditioning and electrical systems for said area will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Friday, August 24, 1956, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, August 2, 1956

U. S. Government

GOVT. OF DIST. OF COL., DEPT. OF SAN'Y. ENG'G., July 26, 1956. SEALED PROPOSALS will be rec'd. in Rm. 404, 499 Pa. Ave., N.W., Wash. 1, D.C., until 2 PM. EDT, Sept. 19, 1956, and then publicly opened and read for constr. of Section No. 4 of E. Branch Piney Br. Trunk Sewer in Kansas Ave. and 5th St. from Varnum St. to Ingraham St., N.W., consist. of 1,555 lin. ft. 14' 6"; 2,376 lin. ft. 14' 6"; and 825 lin. ft. 3' 6" to 10' 6" dia. brick and reinf. concr. masonry sewer (IN TUNNEL); and 395 lin. ft. 12" to 5' 6" dia. brick and reinf. concr. masonry sewer and 165 lin. ft. 12" dia. cast iron watermain (IN OPEN CUT). Proposal forms, plans and specns. obtainable from Supervisor, Contr. & Bond Section, Procurement Office, D. C., Rm. 406, 499 Penn. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to Collector of Taxes, D. C. (Tel. NA 8-6000, Ext. 2378).

OFFICIAL PROPOSALS

Bids: August 8, 1956

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 a.m. on Wednesday, August 8, 1956.

For Contract No. WB57, Painting the Bronx-Whitestone Bridge and Incidental Structures, Boroughs of the Bronx and Queens, City of New York.

Each bid must be accompanied by a deposit in the amount of twenty thousand Dollars ($20,000).

Specifications, bid and contract form may be purchased at the office of the Authority for $10.00. The purchase price will not be refunded.

All information may be obtained at the office of the Authority.

GOVERNMENT OF IRAQ
DEVELOPMENT BOARD & MINISTRY OF DEVELOPMENT BAGHDAD

BAGHDAD POWER STATION
CONTRACT NO. 5
CIVIL ENGINEERING WORKS

The Development Board and the Ministry of Development of the Government of Iraq invite tenders from experienced Civil Engineering Firms for the construction of the Civil Works for the Baghdad Power Station, Iraq.

Tender Documents may be inspected on and after July 16th, 1956 until September 10th, 1956 at the following addresses:—

1) Directorate General of Legal Affairs and Contracts, Ministry of Development, Development Board, Baghdad.
2) Embassies of Iraq, in Washington, London, Paris.
3) Royal Legations of Iraq in Bonn, Brussels, and Rome.
4) Consul Honoraire of Iraq in Stockholm and Egyptian Legations in Bern and the Hague.
5) At the office of the Consulting Engineers, Messrs. Electrobel-Traction & Electricite, 1, Place du Trone, Brussels.

Firms desiring to tender may obtain two sets of Contract Documents, each set consists of Volume 1, 2, 3A, 3B, 3C, 3D, and 4 for tender, on and after July 16th, 1956 until September 10th, 1956, from either the Directorate General of Legal Affairs and Contracts at the Development Board offices, Baghdad, or Messrs. Electrobel-Traction & Electricite, 1, Place du Trone, Brussels, Belgium, or the above mentioned Embassies and Legations on payment of thirty Iraqi Dinars or the equivalent of same. This charge will not be returned to the tenderers.

All tender documents are to be submitted in English, and they must be accompanied by a deposit of ID 12,000 (Twelve thousand Iraqui Dinars), which must be paid in cash to the Directorate General of Accounts of the Ministry of Develoment and the receipt issued for such payment must be attached to the Tender Documents. Such cash deposit may be replaced by a Bank Guarantee from or through an approval bank in Iraq.

Tenders must be submitted in sealed envelope marked on the outside "BAGHDAD Power Station—Tender for Civil Engineering Works". They must be delivered at the Ministry of Development on or before 12 noon local time on September 24th, 1956. If sent by post the tenders shall be registered, but tenderers must assure themselves of delivery to the Board in the due time. A letter of capacity, method of procedure, articles of association, are to be submitted with the tender at the same time.

Tenders not submitted within the time specified or not accompanied by a receipt of the deposit or Bank Guarantee shall be neglected.

The attention of tenderers is called to the fact that early completion of the project is desired, and therefore an early completion date will be considered an important factor in the selection of the successful tenderer.

The Development Board does not bind itself to accept the lowest or any tender.

Minister of Development.

E.C.

Read the Official Proposal Columns of ENGINEERING NEWS-RECORD This Week and Every Week

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Bids: September 5, 1956

Contract BP-120.002

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
PIER NO. 11
BUILDING, PAVING AND UTILITIES

Sealed proposals for construction of a transit shed for Pier No. 11 at Atlantic Basin, Brooklyn, N. Y., together with paving and utilities therefor will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Wednesday, September 5, 1956, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1112. Documents will be furnished upon deposit of $50.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $50.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, August 2, 1956

U. S. Government

Department of Commerce, Bureau of Public Roads, July 18, 1956. SEALED BIDS will be received at the office of the Bureau of Public Roads, First National Bank Building, Florence, Alabama, until 10:00 a.m., C.S.T., AUGUST 17, 1956, for the construction of Project 3H12, Natchez Trace Parkway, Webster County, Mississippi. Steel I-Beam Bridge and Approaches over Columbus and Greenville Railway and County Road. Aggregate length: 0.0995 mile. The approximate quantities of the more important items are as follows: 37,700 cu. yd. Excavation and Borrow, 1,050 cu. yd. Concrete, 190,000 lb. Reinforcing Steel, 111,000 lb. Structural Steel, and 12,000 lin. ft. Treated Timber Piling. Minimum wage rates have been fixed as required by law. Plans, specifications and proposal forms are available upon request at the address given above, or Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia. H. J. Spelman, Division Engineer.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4737) will be received at Weaverville, California, until August 30, 1956, for furnishing labor and materials for County Road Relocation for Trinity Dam; Access Road for Lewiston-Spring Creek Tunnel; and Piers, Abutments, and Approach for Trinity River Bridge, Trinity River Division, Central Valley Project, California. Location near Lewiston, California. Principal items are 1,073,000 cu. yds. excavation; furnishing and laying 5,100 lin. ft., 12- to 60-inch corrugated metal pipe; 430 cu. yds. concrete; 31,600 cu. yds. crushed rock base; 242 tons liquid asphalt; and other work. Completion time 270 days. For particulars, address Bureau of Reclamation, Weaverville, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4739) will be received at Albuquerque, New Mexico, until August 28, 1956, for furnishing labor and materials for Earthwork, Clearing, and Structures for Irrigation Rehabilitation of Socorro Units 1 and 2, Middle Rio Grande Project, New Mexico. Location near Socorro, New Mexico. Principal items are clearing areas of waterways; cleaning reaches of waterways; 810 cu. yds. concrete in structures; 7,800 lin. ft. concrete pipe, 6- to 48-inch; 1,530 lin. ft. corrugated-metal pipe, and other work. Completion time 160 days. For particulars, address Bureau of Reclamation, P. O. Box 252, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4738) will be received at Albuquerque, New Mexico, until August 30, 1956, for furnishing labor and materials for Earthwork, Clearing, and Structures for Irrigation Rehabilitation of Belen Unit 1, Middle Rio Grande Project, New Mexico. Location near Isleta, New Mexico. Principal items are clearing about 51 acres of waterways; cleaning about 11 miles of waterways; 2,109 lin. ft. concrete pipe, 12- to 48-inch diameter.; 393 lin. ft. corrugated-metal pipe, 10- to 18-inch diameters; and other work. Complete time 160 days. For particulars, address Bureau of Reclamation, P. O. Box 252, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

EMPLOYMENT OPPORTUNITIES

(Continued on pages 82-86)

REPLIES (Box No.): Address to office nearest you c/o This publication. Classified Adv. Div.
New York: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Assistant Professor—To teach undergrad courses in structures and applied mech. Salary depends on qualifications of Civil Eng., Univ. of No. Dakota, Grand Forks, N. Dak.

Engineers for municipal and industrial water supply, sewerage and treatment projects. Opportunities for permanent connection with long established firm of consulting engineers in mid-west. Both E.I.T.'S and engineers considered. Full information and references in first letter requested. P-2316, Engineering News-Record.

Road Construction Superintendent, Southern Connecticut area. All types of road construction, preferably asphalt. Please state qualifications. All replies held confidential. P-2348, Engineering News-Record.

Civil Engineers to work with consulting engineering firm. Long established municipal consulting firm desires to secure civil engineers for permanent positions. Experience in some phase of municipal Engineering required. Offices located in very desirable small college community in Colorado area. Expansion of firms operations provide unlimited opportunities for advancement for properly qualified engineers. Firm desires to employ engineers with from one to fifteen years experience. Salaries $5,100 to $7,200. Please give experience and full details in reply. Replies will be held confidential if requested. P-2371, Engineering News-Record.

Registered Engineer with minimum 5 years experience in tunnel construction to act in capacity of safety engineer for Ohio sewer project. Familiarity with compressed air construction and all safety methods essential. Please state full qualifications, experience, references and salary requirements in first letter. P-2221, Engineering News-Record.

Designers—Steel, Concrete, Electrical Piping, Air-Cond., Power Plants & Industrial Bldgs. Marbarry Corp., 130 Greenwich St. N.Y.C. Rector 2-3749.

(Continued on following page)

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
Part Time Work
Civil Service Opportunities
Selling Opportunities Wanted
Selling Opportunities Offered
Employment Agencies
Employment Services
Labor Bureaus

DISPLAYED ——RATES—— **UNDISPLAYED**

The advertising rate is $28.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

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Subject to Agency Commission.

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Discount of 10% if full payment is made in advance for 4 consecutive insertions.

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Send NEW ADS and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36, N. Y.

POSITIONS VACANT

(Continued from preceding page)

Highway and Bridge Designers and Draftsmen needed for work in Rhode Island area. Send experience record to P. O. Box 752, Providence, Rhode Island.

Wanted Civil Engineers as resident engineers on large sewage project involving sewage treatment plant, pumping stations, and 63½ miles of intercepting sewers including 30 miles in tunnel. Must be experienced. Give full particulars and salary first letter. Allegheny County Sanitary Authority, 701 Civil Building, Pittsburgh 19, Pennsylvania.

Associate Professor of Civil Engineering—BS & MS in Civil Engineering to teach engineering mechanics, surveying, highway & reinforced concrete. Salary $5400 for nine months. Location—Texas. P-2297, Engineering News-Record.

Graduate Civil Engineer, Architectural Engineer, or Architect with experience in building construction to make quantity surveys of building materials. Interested in man desiring to locate in Wichita, Kansas, permanently. Martin K. Eby Construction Co., Inc., 610 N. Main, Wichita, Kansas.

Wanted: Civil Engineers for permanent work on bridges in both design and field offices of established consulting engineer. Please send education and experience resume, references, and salary requirement. P-2368, Engineering News-Record.

Construction Mgr. for expanding metrop. G. C. Supt. & labor following, CE degree. State details, salary. P-2262, Engineering News-Record.

Hydraulic Engineer: The State of New Jersey has immediate vacancies for graduate civil engineers interested in flood control or water supply development studies. Positions under Civil Service with retirement provisions. Entrance salary $4560 to $6420, depending upon qualifications. For further information write to Division of Water Policy and Supply, 520 East State Street, Trenton 25, New Jersey.

Construction Superintendent to work as assistant to General Superintendent. A paving and bridge contractor doing $10,000,000 annually working in the middle west is desirous of employing an assistant to its present General Superintendent, a man who can become General Superintendent in the shortest possible time. This man should have the necessary construction experience and the ability to work with other job superintendents. The present General Superintendent is the writer of this ad and all answers will be treated in strict confidence. Starting salary $12,000.00 but you can earn more immediately if you are the right man. P-2407 Engineering News Record.

Mechanic or master mechanic with experience on road and bridge contractor's equipment with the ability to eventually take complete charge of contractor's equipment repair shop and mechanics. This is an unusual opportunity salary $12,000.00 per year. P-2411 Engineering News Record.

Equipment superintendent—Master mechanic to supervise repair of equipment in Main Shop of progressive construction organization. Permanent position with good opportunity for right man. State previous experience. Salary open. P-2449 Engineering News Record.

Graduate Civil Engineer—Preferably experience in road, bridge, and drainage design, for position in the Public Works Department of Anne Arundel County, Maryland. Submit with application resume of experience and salary desired. E. R. Lonergan, County Business Manager, Anne Arundel County, Maryland. Box 506, Annapolis, Maryland.

POSITIONS VACANT

Experienced Steel Detailer for checking shop details in contractor's office. 40 Hour week at $5.00 per hour. Location: Washington, D.C. Roscoe Engineering Corp. & Associates, 1107-19th Street NW, Washington 6, D.C. Attn: Chief Engineer.

Construction Mgr. CE. Must have metropolitan labor following, ability to run multi-million business for Bergen Co. builders. Write details, salary. P-2440, Engineering News-Record.

Wanted Civil Engineer experienced in Municipal Engineering. Liberal Benefits, including annual wage increase, paid vacations, sick leave, retirement plan and social security, group life insurance, sick and hospital benefits. Contact Superintendent Public Works, City of Keene, New Hampshire

Engineer of Tests: For multi-plant portland cement mfr. Should have good understanding of cement chemistry plus experience with concrete. Sporadic travel expected but work primarily in Chicago office. Please list qualifications, salary range desired and personal data in your letter. Reply P-2365, Engineering News-Record.

Wanted: Highway designers, draftsmen and field men for highway work. Location Northeast New Jersey. P-2462, Engineering News-Record.

Construction engineer with college degree in engineering or equivalent, practical experience in light construction (shopping centers, motor hotels). Job consists of estimating, purchasing and general supervision of construction. Excellent and permanent opportunity. Give age, experience, salary desired and references. P-2465, Engineering News-Record.

Wanted — Heavy and highway construction superintendent, capable of running large grading, drainage and bridge work. State experience, age and educational background. P-2473, Engineering News-Record.

Civil Engineers, experienced in design of sewerage systems and treatment plant. Excellent opportunity for young sanitary major in expanding well-established firm. Location southern Connecticut. Genovese & Associates, 294 Elm Street, New Haven, Connecticut.

Wanted: Office Engineers to design municipal street paving and sewer projects. Live in heart of beautiful Ozarks, land of hunting, fishing, and many sports activities, excellent school system—grade, high school, and college, cheap living costs. Salary commensurate with training and experience, plus paid vacation and sick leave. Contact Personnel Department, City Hall, Springfield, Missouri.

Inspectors wanted. Excellent opportunity for qualified personnel in one of the fastest expanding industrial areas of the South. Soils, asphalt, welding, pressure vessel, structural steel, millwright, paint, electrical and telephone. State experience, expected salary and references. Applications answered and kept confidential. P-2514, Engineering News-Record.

Assistant Professor and Instructor in Civil Engineering needed by fully accredited and attractively located University in the Southeast. Principal subjects, mechanics, materials, and surveying. Instructor may work toward M.S. degree while teaching full time. Salaries open, depending upon qualifications. P-2516, Engineering News-Record.

Engineer (Construction) with major field and office experience in all types of piling work. Ability to interpret plans and make quantity take-offs important. Experience in this special field essential. Give full details of education and experience. P-2491, Engineering News-Record.

SALARIED POSITIONS $5,000 — $35,000

We offer the original personal employment service (established 46 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars.

R. W. BIXBY, Inc.
559 Brisbane Bldg. Buffalo 3, N. Y.

POSITIONS VACANT

Designers—Highways and Bridges—to work in New York office. Top rates for qualified men. Write in detail to: Farkas & Barron, Consulting Engineers, #5 Beekman Street, New York 38, N. Y.

Civil Engineer by Consultant in general civil engineering practice: Excellent opportunity for future advancement. Location in growing community in central Illinois. Salary open. Please furnish complete resume, including salary desired. P-2491, Engineering News-Record.

Salesman Rockland County, N. Y., road building materials and construction. Old established business requires able young man with car. Experience preferable but not required. Interest in bituminous pavement construction essential. Salary plus expenses. Write Box 120, Haverstraw, New York.

Young Man — (25-40) — Civil Engineer for bituminous road work—costs, etc. Car furnished; steady employment and advancement, wages commensurate with ability. Write Box 120, Haverstraw, N. Y.

Construction Superintendent—for work in Bahama Islands. Experienced in rock excavations, concrete work and water work. Excellent opportunity Write giving age, past experience, availability and salary requirements. P-2507, Engineering News-Record.

Cost Engineer experienced in heavy construction and foundations, with knowledge of estimating. Location New York City. Good opportunity with internationally known company. P-2506, Engineering News-Record.

Instrument men, party chiefs, asphalt & soil inspectors—O'seas airbase, mild climate. Call or write Mr. Lambert, Patchen & Zimmerman, 120 Greenwich St., NYC RE 2-4187.

Wanted General Highway Construction Superintendent. A large nationally operating highway contractor, head-quartering in Midwest, needs a general superintendent qualified with perience and ability to generally supervise operations working under one of our regional managers in Eastern states. Our projects are numerous and varied: Heavy grading, structures and paving. Require lots of travel from job to job, conferring with job superintendents, planning organization and equipment requirements and general job operations. Important future for right man. Profit sharing, pension, stock ownership, etc. P-2518, Engineering News-Record.

Location: Venezuela. General Manager for U. S. heavy works contractor large U. S. Heavy works contractor who also operates internationally wants experienced contractor's manager with good understanding of Latin American conditions and people. Must be trustworthy and capable of first class administration, negotiation and organization. To right man a bright future, good salary, profit sharing, pension, stock ownership. P-2523, Engineering News-Record.

Supervisory positions for High Dam Construction in India. Former Supervisory employees or those now in supervisory positions who have worked with me on projects in the past and are interested in foreign work. Contact me by letter: M. H. Slocum, 504 East Pine Street, Alhambra, California.

(Continued on page 86)

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Graduate Electrical, Mechanical, Civil or Chemical Engineers with minimum 10 years' experience supervising construction of industrial buildings, oil processing and oil handling facilities. Engineering degree essential. To assist in constructing expanding company facilities of major foreign operating oil company located in Saudi Arabia. Generous salary plus living allowance: liberal all-inclusive benefit program.

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ground support equipment

Senior Design Engineers, Design Engineers, Development Engineers, Test Engineers, Designers—for Rocket Engine program.

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Work on mobile and semi-fixed Ground Support Equipment employed in handling, servicing, testing, storing and transporting large, liquid-propellant Rocket Engines and Sub Assemblies for strategic and tactical missile applications. Familiarity with Mil Specifications pertinent to design and test of such equipment will be an asset; also ability to analyze equipment requirements; prepare specifications; outline and conduct test programs; knowledge of vendor liaison and coordination problems.

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City Engineer
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College graduates with minimum 6 years' work experience in industrial engineering, cost analysis or related activities. To provide industrial engineering services ranging in scope from shop layout to organizational changes in major oil producing operations.

Write, giving full particulars regarding personal history and work experience. Please include your telephone number.

Recruiting Supervisor, Box 93

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505 PARK AVENUE
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EXPERIENCED HYDRAULICS ENGINEER WANTED

Graduate engineer experienced in paper mill hydraulics, planning and development of piping layout systems, etc. for large expanding and progressive mill in Maryland. Good salary, all benefits and excellent opportunity for advancement. Send detailed resume of experience and education to

Director of Personnel
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Immediate Openings

DESIGN ENGINEERS

Must have degree or Equivalent plus min 8-10 years design experience. $8736 to $12,480 plus overtime.

Living allowance covers entire cost of board and room. Sick and vacation leaves.

P-2382, Engineering News-Record
Class. Adv. Div. P.O. Box 12, N.Y. 36, N.Y.

ENGINEER

(CIVIL—OVERSEAS)

HIGHWAY MATERIALS and TESTING ENGINEER

Position: In charge of modern highway testing laboratory and materials survey in Near East.

Requirements: 15-20 years experience. Ability to organize and direct a country wide materials survey and train personnel in testing operations.

Top salary—good living conditions—liberal benefits including paid transportation for wife.

P-1812, Engineering News-Record
330 West 42 St., New York 36, N. Y.

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400 W. Madison St. Chicago 6, Ill.

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Must be graduate civil engineer with minimum 5 years' well-rounded engineering experience. Liberal salary plus allowances and generous benefits.

Write outlining personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 178

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Submit resume stating education, experience and salary.

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Construction Superintendent for one-half million dollar industrial building project in South Florida. This is an excellent opening for permanent position in new Miami branch office of established general contractor. Prefer engineer with, at least, seven years' experience, partly field, partly estimating, under thirty-five years. Salary open, with hospitalization, profit sharing plan and other benefits. Prefer man presently employed but wanting better opportunity and to locate permanently in the South Florida area and is able to assume a share of management in aggressive rapidly growing company. Present employer will not be contacted without your approval and expenses will be paid qualified applicants for local interview.

Similar position open in Atlanta, Georgia office. **Also position** for man experienced in the mechanical contracting field specializing in fuel handling systems for petroleum industry, jet fuel, natural gas, water and sewer lines. Field and office experience desired.

P-2495, Engineering News-Record
Class. Adv. Div. P.O. Box 12, N. Y. 36, N. Y.

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Please submit complete resume giving education, experience, salary desired, and date of availability.

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Graduation from a college or university of recognized standing with a degree in engineering, specializing in structural engineering, and 5 years experience in a responsible capacity involving design of all sizes and classes of buildings and structures or an equivalent combination of experience and training. Salary $5980-$7020 per year. Complete details by writing to *Director of Personnel, Municipal Building, Hartford, Conn.*

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for engineers and draftsmen at Dresser-Ideco Company. Here, some of the world's tallest structures are being engineered and . . . like many Dresser-Ideco super-tall TV antenna towers . . . opportunities for Dresser-Ideco engineers and draftsmen are climbing, too. There may be a place for you on the Company's rapidly expanding engineering team with the potential for rapid advancement into management and development responsibilities.

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Experienced structural steel detailers on all types of building and conveyor work. Long range program, good working conditions in a Consulting Engineers Office, paid holidays, vacation plan and health and accident insurance program.

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CE or Arch. experienced in structural steel, steel design, detailing, checking and estimating to understudy for chief engineer job with outstanding central Ohio firm, $8500. NO FEE. Submit detailed resume and photo to Personnel Associates, 83 South High Street, Columbus 15, Ohio.

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Manufacturer located in central New Jersey desires representation in New England, South Atlantic, and South Central for line of Joint Sealers, Concrete Curing and Caulking Compounds. Must have contact with Contractor Equipment Dealers, Contractors and Engineering Constructors. Write qualifications and present representation if handling under five or six lines only.

RW-2292, Engineering News-Record
Classified Adv. Div., P.O. Box 12, New York 36, N.Y.

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Architects

Highway—Bridge
Designers—Draftsmen
Soils Engineer
Irrigation Designer
Construction Engineer (Irrigation)
Architectural Designers—Draftsmen
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Civil Engineering Draftsmen

Air Mail Resume TO R. L. SHAW, *Personnel Director*

MICHAEL BAKER, Jr., Inc.
BAKER BLDG. *Consulting Engineers* ROCHESTER, PA.

(Continued from page 82)

EMPLOYMENT AGENCIES

Wanted Engineers, Designers, Draftsmen-Structural, Architectural, N.E., C. E., E.E., and Ind. also Teachers and Chemists. Cleveland Engineering Agency, 2132 E. 9, Cleveland.

POSITIONS WANTED

Structural Engineer P.E. seeks respons. design or admin. position with consultants or contractor. 15 yrs. exp. steel and concrete building design, concrete detailing, constr. problems. Salary $10,000. PW-2395, Engineering News Record.

Mr. Contractor, Do You Need: 1 Additional work and greater profits? 2. Financial or technical assistance? 3. Management relief? I can help you increase your volume and margin of profits! Young, capable, experienced, energetic, ambitious management executive will consider position with small or medium sized contractor with ambition and potential for growth. PW-2438, Engineering News Record.

Construction Executive, thoroughly experienced industrial, commercial construction—all phases building industry: estimating, buying, field management. PW-2396, Engineering News Record.

Project supt. engineer background twenty years bridges, foundations, highways, bldgs. Desire profit share contract. Southeast U. S. PW-2355, Engineering News-Record.

Contractor's Engineer, graduate C. E. licensed. Heavy construction and Buildings. Wide experience in estimating, purchasing, negotiation of contracts and extra work, field supervision and project management. Thorough knowledge and experience in the successful preparation and processing of construction claims on government and state work. Presently employed by Contractor in New York and Philadelphia areas. Available on reasonable notice. Willing to prove ability before definite commitment. PW-2443, Engineering News Record.

Construction superintendent over 20 yrs. experience extensive industrial, commercial and finished projects. Engineer. Anywhere. Salary fitting. PW-2436, Engineering News Record.

Young executive engineer 32—aggressive, ambitious, tactful, BSCE. 7 yrs. field exper. heavy industrial constr. Knows costs, planning, field management. Present salary $8,000. Desires opportunity. PW-2361, Engineering News-Record.

City Engineer and Building Commissioner of city of 35,000 in Illinois desires to make change, South preferred. Sixty-six years old, many years service Federal, State and municipal. Qualified for above jobs or city manager. Hold Illinois license, member American Society of Civil Engineers. PW-2377, Engineering News-Record.

Construction Executive: Fully qualified. Seventeen years in all phases of commercial and industrial construction. Estimating to completion, contract negotiation, project management. Age 40. Domestic or foreign. Seek new permanent connection with possible future advancement. Minimum $14,000. PW-2360, Engineering News-Record.

Civil Engineer, (soils, concrete), BSCE, 28, experience in construction engineering, supervision and control of earthwork and concrete. Desires permanent position. PW-2508, Engineering News-Record.

Construction Superintendent, 31, B.S.C.E., experienced on Dam overseas, hospitals, Corps of Engineers and A.E.C. projects in U. S., good owner and labor relations, have good following. Salary $200,000. PW-2502, Engineering News-Record.

POSITION WANTED

Civil Engineer age 39 with 18 years experience in heavy construction and municipal work, desires to establish permanent location in municipal or other work on completion of present construction job as resident engineer. Good record, excellent references. Available Sept. PW-2487, Engineering News- Record.

Project Manager, 43, familiar with all phases of housing from land planning to closing. Major experience in const. of units, utilities and land improvements. Cost and control conscious. Good record in handling men and subcontractors. PW-2497, Engineering News-Record.

General Supt. Previous experience includes office and field responsibility for completion of commercial, housing, utility and land improvement work can make job breakdowns and keep running costs. Desires connection with growing organization needing matured help in their expansion. Age 42. PW-2501, Engineering News-Record.

Sales Engineer, BSCE, under 30. Background in heavy construction. Wishes to join growing construction equipment or materials company. PW-2504, Engineering News-Record.

Projeict Mgr. or Gen. Constr. Supt. refinery, power plant, chem. plants, gas transmission etc. Also some A.E.C. College background, good following. Reply to PW-2528, Engineering News-Record.

Construction Manager. Industrial constr. Civil Engr., job-planning, cost-control, estimating & management specialist. Now situated Phoenix. Confidential replies. Reply PW-2527, Engineering News-Record.

Sanitary Engineer, 33, BCE, 8 years health dept. experience with water and waste treatment, seeks sales, design, or operational position in S.E. area. PW-2526, Engineering News-Record.

Registered Civil Engineer and Land Surveyor, age 31, extensive experience in highway design, specializing in drainage and hydraulics. Now employed in Central America. Present salary $16,800. Scheduled for re-assignment to the U. S. but wishes to continue foreign work. Good reading and speaking knowledge of Spanish. PW-2525, Engineering News-Record.

Electrical Engineer, registered, 46, 20 years experience in electrical construction field, engineering, estimating and job supervision, industrial and institutional, 15 years with one company, desires permanent position of responsibility, available in ninety days. PW-2475, Engineering News-Record.

Construction Management—BSCE, 36, excellent experience in heavy construction including field supervision, estimating, bidding and management of concrete structures, earthworks and powerplants, interested in connection with moderate size contractor with growth possibilities in Rocky Mtn. or Southwest. Can consider participation arrangement. PW-2515, Engineering News-Record.

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Available, experienced in railroad location, construction, operation, docks, terminals, ore handling facilities, etc. Eight years experience in foreign connections in responsible charge. Graduate civil engineer. M. ASCE and AREA.

PW-2472, Engineering News-Record
Class. Adv. Div. P.O. Box 12, N.Y. 36, N.Y.

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P.O. Box 921 Lake Worth, Florida

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
New York: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

SPECIAL SERVICES

Contract Disputes? Government construction contractors who have contract questions under dispute are offered assistance in the settlement or the appeal of said disputes. SS-2133 Engineering News Record.

WORK WANTED

Work Wanted: a group of Professors would like to undertake design and checking of buildings, highway bridges, etc. Preliminary drawings ready in 48 hours. WW-2316, Engineering News-Record.

BUSINESS FOR SALE

Demolition Service Company supplying compressed air equipment and manpower to all trades allied with the construction industry. Ill health forces me to give up this profitable business of 18 years. Full details will be given to any interested party.

BO-2345, Eng. News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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520 No. Michigan Ave.
MOhawk 4-5800
W. HIGGENS

CINCINNATI, 37
1825 Yorktown Rd.
Clifton Village, Apt. 2
REdwood 1-3238
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CLEVELAND, 15
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SUperior 1-7000
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Write for list of our qualified graduates.

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Tractor Shovel, late model and 3/8 yd. Truck Mounted Back Hoe

W-2229, Engineering News-Record
Class. Adv. Div. P.O. Box 12, N.Y. 36, N.Y.

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For 440 Volt, 3 Phase Service

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Send your instrument to the factory for repair, rebuilding, adjustment. Write today for "Repair Service" leaflet.

W. & L. E. Gurley, Dept. R, Troy, N. Y.

PUBLIC AUCTION

AUG. 7, 1956 - 10 A.M.
City Hall, 78 Bayard St.
New Brunswick, N. J.

9 GMC Trucks with 15 cu. yd. Packer Type Bodies

2 GMC Dump Trucks—7 cu. yd.

Trucks can be seen at City Yard, Jersey Avenue, New Brunswick, N. J. from 9 A.M. to 3 P.M., Monday through Friday

Consolidated Water District No. 1 of the Town of Greenburgh wishes to dispose of the following used pumping equipment:

2—Gould Centrifugal Pumps—Capacity 500 G.P.M. against 230 ft. head with 50 H.P. General Electric motor—3 phase, 60 cycle, 220 volt.
1—Gould Centrifugal Pump—Capacity 1000 G.P.M. against 291 ft. head with 125 H.P. General Electric motor—3 phase, 60 cycle, 220 volt.
2—Delaval Centrifugal Pumps—Capacity 1000 G.P.M. against 257 ft. head with 100 H.P. General Electric motor—3 phase, 60 cycle, 220 volt.
2—Electric Vacuum Pumps for above pumps.
1—Lexington Electric Switch Board.
2—Sundh Electric Switch Boards.
2—Electrically operated Bristol Pressure Recorders.

Inspection of this equipment may be arranged by writing Mr. Louis Russo at the Greenburgh Water Department office, P. O. Box 245, Hartsdale, N. Y., or by calling WHite Plains 9-6230.

The Town Board of the Town of Greenburgh will receive sealed bids for the purchase of any or all of this equipment at the Town Board Room, Larkin Building, Tarrytown, N. Y., until 2:00 P.M., D.S.T., August 28, 1956, when such bids will be publicly opened and read.

The Town Board reserves the right to reject any or all bids or to accept any bid they deem to be in the best interest of the Water District.

By Order of the Town Board of the Town of Greenburgh.

ELIZABETH C. SMITH
Town Clerk

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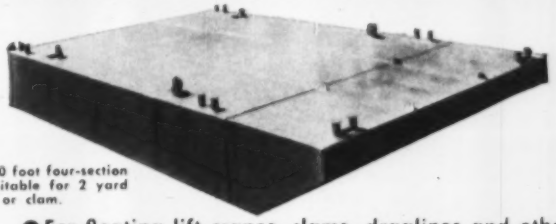

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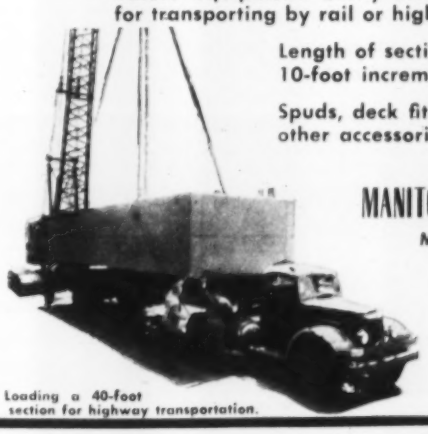

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Pozzolans in Pavements

THE NEW HIGHWAY PROGRAM, with its potentially vast requirements of concrete, seems to have sparked an interest in the possible use of pozzolans as one of the concrete ingredients. How strongly this interest is shared by decision-making highway authorities is not known, but other engineers have been discussing it, and the power companies, whose smoke stacks emit one of the artificial pozzolans, fly ash, are showing more than usual interest in disposing of this waste product.

The use of pozzolans in pavement concrete is an intriguing subject largely because of the success attained by their use in several concrete dams. Whether the advantages shown with the lean concretes of hydraulic structures would be the same for the richer mixes required for road pavements is, however, yet to be proved, and this adds to the interest in the subject.

Most of the natural pozzolans are found in the West and have been used there—a pumicite in Friant Dam, a calcined opaline shale in Davis Dam and a calcined diatomaceous earth in Bonneville Dam and one of the California Edison Co.'s dams on the St. Joaquin River, to mention the outstanding examples. In the Middle West and East, recourse must be had to artificial pozzolans, and the best and cheapest is generally conceded to be fly ash. The most notable instance of the use of fly ash was in Hungry Horse Dam in Montana, completed in 1953, where by the use of fly ash a 2-bbl per cu yd concrete was possible compared to the 4-bbl mix on Hoover Dam. Presently, fly ash is being used in the concrete for a 1½-mi underwater concrete wall of gravity section being built around the Army Pier in Boston.

For these mass concrete jobs, concretes in which a 20 to 35% replacement of cement with fly ash has been made have been characterized by good workability, adequate strength, low drying shrinkage, excellent watertightness, low expansion and good weathering resistance. And since fly ash costs about one tenth as much as cement, its economy has an important appeal.

Whether all of these good qualities would be present in the kind of mixes suitable for pavements, or whether theyw ould be necessary, has not been established by experience. Air entrainment, now universally practiced with paving concrete, already provides the required workability. The strength gain is slower with pozzolan mixes than with straight portland cement, and this might be a disadvantage. Wearing qualities of pozzolan concretes are virtually unknown.

With respect specifically to fly ash, only that containing less than about 7% carbon and having a fineness represented by a specific surface of something over 2,500 is suitable as a cement replacement. The problem of its supply in sufficient quantities and at enough locations for its efficient use in the highway program is, therefore, one to be solved. Moreover, since the quality of fly ashes varies, and therefore their effect on the concrete, specifications and inspection for pavement work would have to be handled carefully. This also suggests that more extensive laboratory studies than are normally made would have to precede and accompany each job in which fly ash was permitted.

None of these problems are, however, insurmountable in theory, so something may actually come out of the present heightened interest in pozzolans in pavements. If it does it will be well worth watching.

Civil Defense Lesson

A SMALL-SCALE BUT DRAMATIC LESSON in what an enemy attack might do to a metropolitan center was provided by a big fire in New York City two weeks ago. It was a lesson that should send defense planners back to the files to uncover and refurbish programs worked out under earlier threats of danger to the homeland.

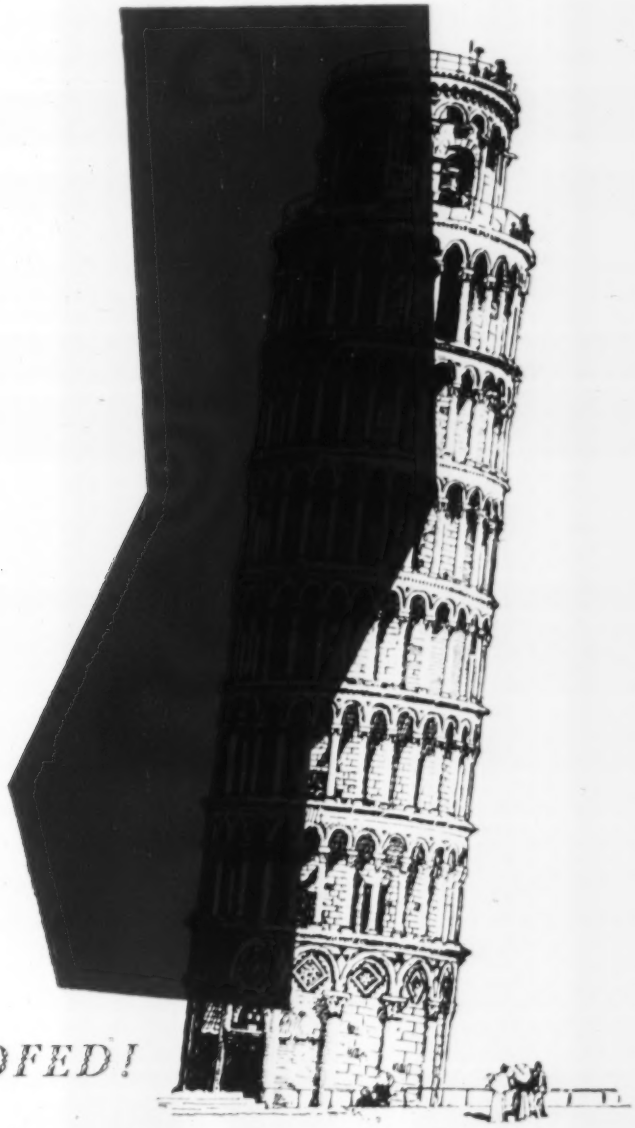
The fire, spectacular enough in itself to recall some of the bomb-induced conflagrations of the war, gutted an empty six-story building. But it was the tons of water poured on the flames which resulted in something almost unthinkable to most New Yorkers: More than half of the city's vast network of underground transit was quite literally halted in its tracks as the water hollowed out an oyster-shaped crater under the tracks, and dropped track, slab and ballast into a deep hole.

Fast work and remarkable cooperation among private contractors, the city's Transit Authority and other city agencies got the subway back into operation in five days time. (ENR July 26, p. 23). And it is worth noting that these are the same organizations that would have been the first line of defense had the crater been caused by a bomb, and not by water action.

The efforts of civil defense agencies are not to be belittled, but it's a simple fact that the first man called on in an emergency is the uniformed policeman on the corner. The civilian volunteer must coordinate his efforts with the regularly constituted agencies.

Interruption of any vital service to a big population center—be it transit, water supply, fuel, sewage disposal—can be crippling, and in wartime could be disastrous. Many public officials and construction men know this, and some years ago much effort was put into planning to coordinate municipal and private construction forces and engineers for such an emergency. But years of peace, or at least only muted threats of war, have produced a lull, and many an elaborate plan has gathered dust in the interim.

An incident such as occurred in New York should be taken to heart. Another time, it might be more than a temporary inconvenience.



SOMEBODY GOOFED!

Only by a freak of fortune does the leaning tower of Pisa still stand. A faulty foundation was not apparent until the structure was three stories high. It is believed the architects were then forced to compensate by adding weight to the opposite side to save the building.

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